

AD-A148 690

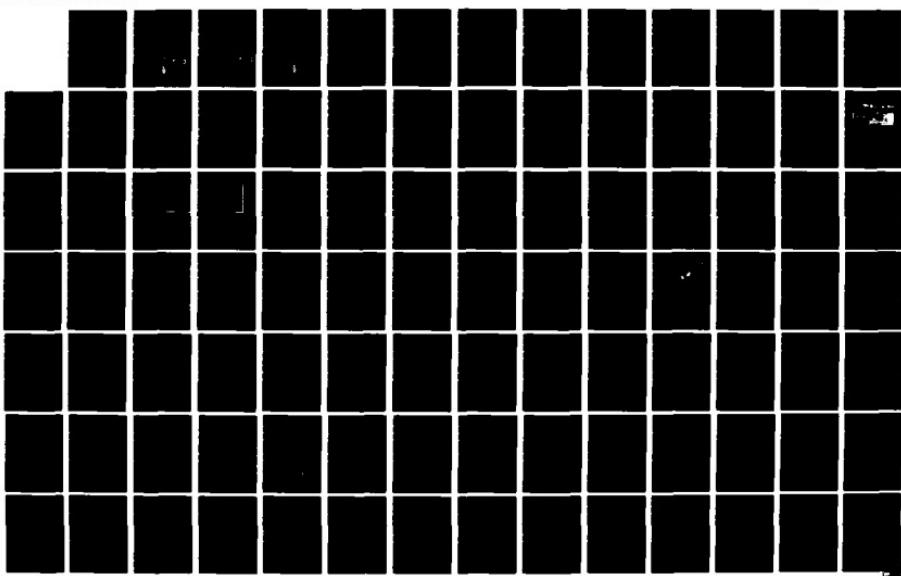
SURVEY AND TESTING OF ARCHEOLOGICAL RESOURCES AT
CLINTON LAKE KANSAS 1978-1979(U) IROQUOIS RESEARCH INST
FAIRFAX VA M NATHAN AUG 88 DACHW41-78-C-0054

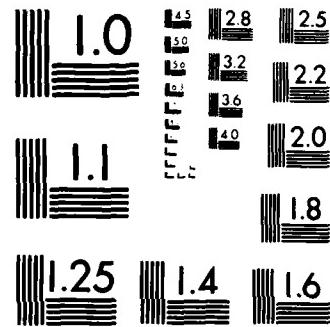
1/4

UNCLASSIFIED

F/G 5/6

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

(12)

SURVEY and TESTING
of
ARCHAEOLOGICAL RESOURCES
at
CLINTON LAKE, KANSAS

1978-1979

prepared for

U. S. ARMY CORPS of ENGINEERS
KANSAS CITY DISTRICT



Under Contract

DACW41-78-C-0054

DTIC
SELECTED
DEC 17 1984

S

DTIC
SELECTED
DEC 17 1984

D

A

B

DTIC FILE COPY



AUGUST 1980

DISTRIBUTION STATEMENT A
Approved for public release Distribution Unlimited

84 12 05 030

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Survey and Testing of Archaeological Resources at Clinton Lake, Kansas		5. TYPE OF REPORT & PERIOD COVERED 1979 Final 1978-1980
7. AUTHOR(s) Michele Nathan Ph.D., Editor		6. PERFORMING ORG. REPORT NUMBER DACPW41-78-C-0054
9. PERFORMING ORGANIZATION NAME AND ADDRESS Iroquois Research Institute		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Corps of Engineers, Kansas City District 700 Federal Building, 601 East 12th Street Kansas City, Missouri 64106		12. REPORT DATE August 1980
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 301
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for release; unlimited distribution		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) <i>→ This report - survey & key words includes:</i>		
18. SUPPLEMENTARY NOTES DTIC SELECTED DEC 17 1984		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) archaeological testing modern historic survey Archaic Clinton Lake Plains Woodland northeastern Kansas Plains Village prehistoric Wakarusa River • ←		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) → This report describes the results of testing and survey in portions of the Clinton Lake Project in northeastern Kansas. Field investigations were conducted during the summer of 1978 and the spring of 1979. Work involved the limited excavation of 19 previously located prehistoric sites and intensive survey of previously unsurveyed portions of the project. Archaeological components relating to the Archaic, Plains Woodland and Plains Village horizons were recognized. Analysis of prehistoric sites in the bottom-lands indicates that there was a marked preference for settlement on well drained soils.		

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

84 : 12 05 030

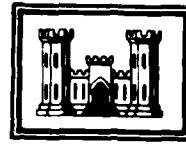
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SURVEY and TESTING
of
ARCHAEOLOGICAL RESOURCES
at
CLINTON LAKE, KANSAS

1978-1979

prepared for

U. S. ARMY CORPS of ENGINEERS
KANSAS CITY DISTRICT



Under Contract

DACW41-78-C-0054



AUGUST 1980

CONTRIBUTORS
OF
IROQUOIS RESEARCH INSTITUTE

Cecil R. Brooks Ph.D.
John D. Hartley A.B.D.
Paul V. Heinrich M.S.c.

Charles H. LeeDecker M.A.
Mark McCallum B.S.
Wesley R. Stinson M.A.c.

with

Carol E. Lindeman B.F.A.
James W. Mueller Ph.D.
Teresa E. Ossim B.S.

Jeffrey Quilter A.B.D.
Geralyn Truszkowski M.F.A.
Kaytee Umbreit B.F.A.

Editor

Michele Nathan Ph.D.

Study Director

Bernard W. Poirier

ABSTRACT

This report describes the results of archaeological testing and survey in portions of the Clinton Lake Project in northeastern Kansas. The field investigations were conducted during the summer of 1978 and the spring of 1979. The testing program involved the limited excavation of 19 prehistoric archaeological sites located during previous work in the reservoir. The survey program involved the intensive survey of previously unsurveyed portions of the project area.

As a result of the archaeological testing, four sites are regarded to be potentially eligible for inclusion in the National Register of Historic Places: 14DO3, 14DO137, 14DO144 and 14DO154. The remaining 15 sites are regarded as ineligible for the National Register. The survey program resulted in the identification of nine prehistoric sites and 19 modern historic sites. Four of the newly discovered prehistoric sites are felt to require secondary testing or investigation in order to assess their potential eligibility for inclusion in the National Register of Historic Places. These sites are 14DO155, 14SH101, 14SH103 and 14SH104. The remaining sites identified during the 1979 survey are regarded as ineligible for the National Register.

Archaeological components relating to the Archaic, Plains Woodland and Plains Village horizons were recognized in the Clinton Lake area. Some sites appear to be special purpose camps, while others may be more permanently or regularly occupied base camps or villages.

The results of deep testing in the Wakarusa floodplain indicate the possible presence of a cultural horizon associated with a paleosol beneath several feet of recent alluvium. Analysis of soil characteristics associated with prehistoric sites in the bottomlands indicates that there was a marked preference for settlement on well drained soils.

Accession For	
NTIS GRA&I <input checked="" type="checkbox"/>	
DTIC TAB <input type="checkbox"/>	
Unannounced <input type="checkbox"/>	
Justification	
PER CALL JC	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



TABLE OF CONTENTS

CONTRIBUTORS	iii
ABSTRACT	v
TABLE OF CONTENTS	vii
INTRODUCTION	1
Scope of the Project	1
Description of the Study Area	4
ENVIRONMENTAL SETTING	5
Climate	5
Physiography	5
Geology	6
Soils	7
Ecosystems	7
Ecological Zones	11
ARCHAEOLOGICAL BACKGROUND	19
Culture History of the Study Area	19
Previous Investigations	28
DISPOSITION OF BACKGROUND DATA	33
METHODOLOGY	35
Research Orientation	35
Site Testing Methods	36
Survey Methodology	38
Laboratory Methods	44
RESULTS	57
Description of Test Excavated Sites	57
Description of Surveyed Sites	143
Prehistoric Summary and Discussion	171
Summary of Historic Resources	195
RECOMMENDATIONS	197
Site Significance and National Register Eligibility	197
Assessment of Project Impacts	201
Mitigation of Adverse Effects	206
Interpretive Potential	207
Summary Recommendations	208
REFERENCES CITED	209
INTERVIEWS	218

TABLE OF CONTENTS

MAPS	219
GLOSSARY	221
APPENDICES	233
A. Scope of Work and Record of Pre-negotiation Meeting Held on 23 January, 1978	233
B. Correspondence	249
C. Inundation Study	283
ABOUT THE AUTHORS	295

List of Tables

Table 1. Selected Archaeological Sequences in the Plains Area	20
Table 2. Cultural Phases Defined in the Clinton Lake Area . .	25
Table 3. Prehistoric Site Size Distribution, Clinton Lake, Kansas	40
Table 4. Artifact Classification for Historic Assemblages . .	43
Table 5. Artifact Code Sheet	48
Table 6. Raw Material Code Sheet for Prehistoric Artifacts . .	52
Table 7. Chert Classification by Color	53
Table 8. Stratigraphic Summary of Excavations, Site 14D03 . .	58
Table 9. Inventory of Prehistoric Excavated Materials, Site 14D03	62
Table 10. Stratigraphic Summary of Excavations, Site 14D0126	65
Table 11. Inventory of Prehistoric Excavated Materials, Site 14D0126	67
Table 12. Stratigraphic Summary of Excavations, Site 14D0127	68
Table 13. Inventory of Prehistoric Excavated Materials, Site 14D0127	69

TABLE OF CONTENTS

List of Tables

Table 14.	Stratigraphic Summary of Excavations, Site 14D0128	73
Table 15.	Inventory of Prehistoric Excavated Materials, Site 14D0128	80
Table 16.	Stratigraphic Summary of Excavations, Site 14D0129	81
Table 17.	Inventory of Prehistoric Excavated Materials, Site 14D0129	82
Table 18.	Stratigraphic Summary of Excavations, Site 14D0130	83
Table 19.	Inventory of Prehistoric Excavated Materials, Site 14D0130	83
Table 20.	Stratigraphic Summary of Excavations, Site 14D0131	85
Table 21.	Inventory of Prehistoric Excavated Materials, Site 14D0131	86
Table 22.	Stratigraphic Summary of Excavations, Site 14D0132	88
Table 23.	Inventory of Prehistoric Excavated Materials, Site 14D0132	89
Table 24.	Stratigraphic Summary of Excavations, Site 14D0133	91
Table 25.	Inventory of Prehistoric Excavated Materials, Site 14D0133	92
Table 26.	Stratigraphic Summary of Excavations, Site 14D0134	93
Table 27.	Inventory of Prehistoric Excavated Materials, Site 14D0134	94
Table 28.	Stratigraphic Summary of Excavations, Site 14D0135	98

TABLE OF CONTENTS

List of Tables

Table 29.	Inventory of Prehistoric Excavated Materials, Site 14D0135	100
Table 30.	Stratigraphic Summary of Excavations, Site 14D0137	102
Table 31.	Inventory of Prehistoric Excavated Materials, Site 14D0137	105
Table 32.	Stratigraphic Summary of Excavations, Site 14D0140	107
Table 33.	Inventory of Prehistoric Excavated Materials, Site 14D0140	109
Table 34.	Stratigraphic Summary of Excavations, Site 14D0144	116
Table 35.	Inventory of Excavated Materials, Site 14D0144	123
Table 36.	Stratigraphic Summary of Excavations, Site 14D0145	125
Table 37.	Inventory of Prehistoric Excavated Materials, Site 14D0145	126
Table 38.	Stratigraphic Summary of Excavations, Site 14D0148	127
Table 39.	Inventory of Prehistoric Excavated Materials, Site 14D0148	128
Table 40.	Stratigraphic Summary of Excavations, Site 14D0154	129
Table 41.	Inventory of Prehistoric Excavated Materials, Site 14D0154	132
Table 42.	Stratigraphic Summary of Excavations, Site 14D0309	136
Table 43.	Inventory of Prehistoric Excavated Materials, Site 14D0309	139

TABLE OF CONTENTS

List of Tables

Table 44.	Stratigraphic Summary of Excavations, Site 14D0310	140
Table 45.	Inventory of Prehistoric Excavated Materials, Site 14D0310	142
Table 46.	Inventory of Prehistoric Recovered Materials, Site 14D0155	144
Table 47.	Inventory of Prehistoric Recovered Materials, Site 14D0156	148
Table 48.	Inventory of Prehistoric Recovered Materials, Site 14D0157	149
Table 49.	Inventory of Prehistoric Recovered Materials, Site 14D0158	151
Table 50.	Inventory of Prehistoric Recovered Materials, Site 14SH101	157
Table 51.	Inventory of Prehistoric Recovered Materials, Site 14SH102	161
Table 52.	Inventory of Prehistoric Recovered Materials, Site 14SH103	162
Table 53.	Inventory of Prehistoric Recovered Materials, Site 14SH104	166
Table 54.	Inventory of Prehistoric Recovered Materials, Site 14SH105	168
Table 55.	Inventory of Prehistoric Artifact Collections: 1978-1979 Testing Program, Systematic Excavated Sample	174
Table 56.	Inventory of Prehistoric Artifact Collections: 1978-1979 Testing Program, Selective Surface Sample	175
Table 57.	Inventory of Prehistoric Artifact Collections: 1979 Survey Program, Systematic Surface Sample . . .	176

TABLE OF CONTENTS

List of Tables

Table 58.	Inventory of Prehistoric Artifact Collections: 1979 Survey Program, Selective Surface Sample	177
Table 59.	Distribution of Prehistoric Sites Tested in 1978 According to Environmental Variables	184
Table 60.	Distribution of Prehistoric Sites Inventoried during the 1979 Survey According to Environmental Variables	186
Table 61.	Site Occurrence Rates for 1979 Survey	187
Table 62.	Distribution of Known Prehistoric Archaeological Sites at Clinton Lake According to Soil and Land Types	188
Table 63.	Preference of Prehistoric Peoples for the Different Alluvial Soils Series at Clinton Lake, Kansas . . .	189
Table 64.	Distribution of Historic Sites Inventoried during the 1979 Survey According to Environmental Variables	191
Table 65.	Presence and Absence of Artifact Data at Historic Sites	193
Table 66.	Management Summary of Known Prehistoric Sites in the Clinton Project Area	202
Table 67.	Chemical Analyses of Soil Samples from Archaeological Site 14D0144, Clinton Lake, Douglas County, Kansas	288

List of Plates

Plate 1.	Vicinity Map of Clinton Lake, Kansas	3
Plate 2.	Ecological Zones, Clinton Lake, Kansas	9
Plate 3.	Eastward View of the Wakarusa River Valley	12
Plate 4.	Surveyed Areas, Clinton Lake, Kansas	29

TABLE OF CONTENTS

List of Plates

Plate 5. Action Hoe	38
Plate 6. CRI Survey Form	45
Plate 7. Tested and Surveyed Sites, Clinton Lake, Kansas . .	59
Plate 8. Chipped Stone Artifacts from 14D03	63
Plate 9. Chipped Stone Artifacts from 14D03	64
Plate 10. Chipped Stone Artifacts from 14D0127, 14D0128 and 14D0131	70
Plate 11. Chipped Stone and Ground Stone Artifacts from 14D0128	72
Plate 12. Cores from 14D0128	79
Plate 13. Chipped Stone Artifacts from 14D0132, 14D0133 and 14D0135	90
Plate 14. Chipped Stone Artifacts from 14D0135, 14D0137 and 14D0140	96
Plate 15. Clovis-like Point Base from 14D0137	101
Plate 16. Core from Site 14D0140	110
Plate 17. Chipped Stone Artifacts from 14D0140	111
Plate 18. Chipped Stone Artifacts from 14D0140	112
Plate 19. Bison Vertebra Recovered from Site 14D0144	114
Plate 20. Chipped Stone and Ceramic Artifacts from 14D0144 . .	120
Plate 21. Chipped Stone Artifacts from 14D0144, 14D0148 and 14D0154	121
Plate 22. Chipped Stone Artifacts from 14D0144	122
Plate 23. Chipped Stone Artifacts from 14D0154	131
Plate 24. Chipped Stone Artifacts from 14D0154 and 14D0310 . .	133

TABLE OF CONTENTS

List of Plates

Plate 25.	Chipped Stone and Ground Stone Artifacts from 14D0154	134
Plate 26.	Bifaces from 14D0155	145
Plate 27.	Chipped Stone Artifacts from 14D0155	146
Plate 28.	Chipped Stone and Ceramic Artifacts from 14D0157, 14SH104 and 14SH105	150
Plate 29.	Chipped Stone Artifacts from 14SH101	158
Plate 30.	Projectile Points from 14SH101	159
Plate 31.	Chipped Stone and Ceramic Artifacts from 14SH103 . .	163
Plate 32.	Chipped Stone Artifacts from 14SH103	164
Plate 33.	Inundation Marker No. 2	289
Plate 34.	Site Map of 14D0144	291
Plate 35.	Initial Inundation of 14D0144	292
Plate A.	The Cultural Resources of Clinton Lake, Kansas	301

List of Figures

Figure 1.	Geomorphological, Geological and Ecological Section of the Wakarusa River Valley near the Confluence with Camp Creek above Richland	13
Figure 2.	Geomorphological, Geological and Ecological Section of the Wakarusa River Valley Upstream of the Confluence with Deer Creek	15
Figure 3.	Pattern of Alluvial Soils along the Wakarusa River and Its Tributaries	190
Figure 4.	Distribution and Depth of Organic Matter in Test Pits at 14D0144	286

TABLE OF CONTENTS

List of Figures

Figure 5. Cross Section of Inundation Marker Installation, 14D0144	290
---	-----

INTRODUCTION

Scope of the Project

This report presents the results of two seasons of archaeological investigations in the Clinton Lake project area in northeastern Kansas. The work was conducted by the Iroquois Research Institute for the U.S. Army Corps of Engineers, Kansas City District in accordance with contract DACW41-78-C-0054. The archaeological investigations included (1) the testing and evaluation of 19 prehistoric sites to determine if they meet the criteria of eligibility for inclusion in the National Register of Historic Places and (2) an archaeological survey of 6,591 acres of the Clinton Lake project area.

Archaeological investigations were performed for compliance with the National Historic Preservation Act of 1966, P.L. 89-665; the National Environmental Policy Act of 1969, P.L. 91-190; Executive Order 11593, "Protection and Enhancement of the Cultural Environment"; the Reservoir Salvage Act of 1960, P.L. 86-523; and the Preservation of Historical and Archaeological Data Act of 1974, P.L. 93-291.

The original contractual scope of work called for the testing of 18 prehistoric sites identified in an earlier survey which focused primarily on the upland portions of the project area (Iroquois Research Institute 1977). The testing program was conducted during the 1978 field season. In August 1978, the Government modified the original scope of work to authorize an archaeological survey of the remaining unsurveyed 6,591 acres of the project area and the testing of one site, 14D0154, which was discovered during the testing of site 14D03. The survey and additional testing were completed in 1979.

A pre-negotiation meeting held in Kansas City on 23 January 1978 was attended by representatives of the U.S. Army Corps of Engineers and Iroquois Research Institute. At this meeting, several points which had a major influence on the subsequent conduct of the testing project were agreed upon. First, the research design called for in the scope of work was discussed, and the Government indicated that a research design need not be submitted in advance of the field investigations and that the contractual scope of work together with the contractor's proposal would provide an adequate statement of the general research orientation which was to be followed in the project.

The extent of testing necessary to fulfill the objectives of the study was also discussed. It was agreed that effort required for testing and evaluation should be based on some measurable parameter in order to protect both parties. A volumetric measure of excavated earth was selected as the best gauge of the test excavation program.

Finally, the Government emphasized that detailed artifact analysis was neither required nor desired. Artifact analysis was to be limited to the

cataloging and description of the collections according to general raw material and functional categories. Detailed analyses such as replicative experiments or edge-wear studies were not authorized. In view of these limitations, emphasis was to be placed upon the recovery and proper curation of data in order to facilitate future academic research which might be undertaken by scholars and students.

During negotiations concerning the contract amendment for additional survey, the Government indicated that budgetary limitations made it impossible to survey the entire area with the intensity of coverage outlined in the Iroquois Research Institute proposal of 10 August 1978. Consequently, the proposed survey coverage was modified so that areas which were most likely to contain potentially significant cultural resources and which would be most subject to adverse impacts would be more intensively examined than the remainder of the areas. The resulting survey coverage was reviewed and accepted by the Government.

It was additionally agreed that all testing in conjunction with the survey of previously unsurveyed portions of the project area would be strictly limited to shovel tests and that, if possible, National Register eligibility determinations would be made on that basis.

A total of 19 prehistoric sites were tested during the 1978 and 1979 field seasons. Four of these sites, 14D03, 14D0137, 14D0144 and 14D0154, are considered to be potentially eligible for inclusion in the National Register of Historic Places. These four sites have the potential to yield considerable information about the prehistory of the Clinton Lake project area and its relation to other cultures in the eastern Plains.

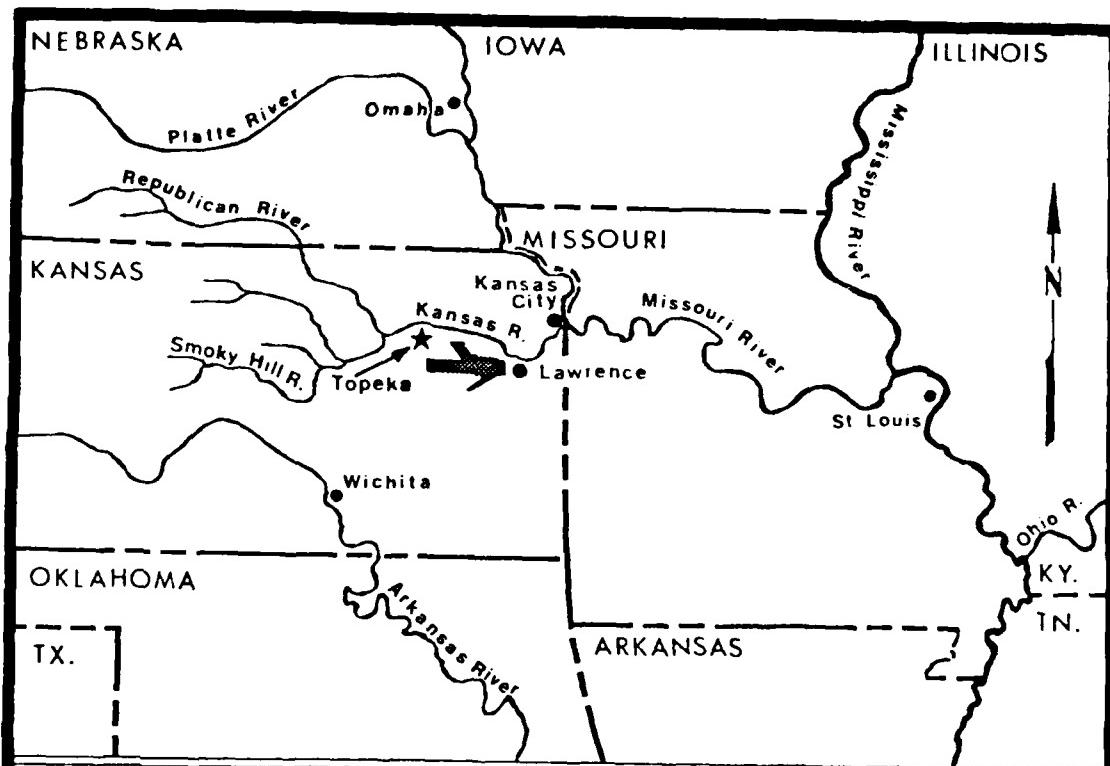
The 1979 survey program focused on the examination of 6,591 acres of project lands not previously surveyed and resulted in the identification of nine prehistoric sites and 19 historic archaeological sites. Four of the prehistoric sites, 14D0155, 14SH101, 14SH103 and 14SH104, may require secondary testing to determine their potential National Register eligibility. Three of these sites are located on the Wakarusa River floodplain, in an ecological zone about which current understanding of prehistoric settlement is limited. Further study of those sites and sites located during previous studies within the project area (Chism 1966; Johnson 1968; Iroquois Research Institute 1977) may increase knowledge of the prehistoric settlement pattern in this zone.

Many archaeological resources will be impacted by inundation or shoreline erosion when Clinton Lake is filled. Other impacts to archaeological sites will result from continued agricultural activity within the project area, intense flooding and vandalism by members of the public using the lake and its recreational facilities. One of the potentially eligible sites, 14D0144, has already been affected by the filling schedule of the lake. Recommendations for mitigation of adverse impacts are included in this report.

In order to prevent vandalism of cultural properties, this public report does not contain precise locational information, although it does contain all the relevant information necessary for the general public to appreciate the

value and extent of cultural resources in the project area. Three separately bound supplemental volumes containing the background data accompany this document and may be reviewed by scholars and other individuals showing good cause.

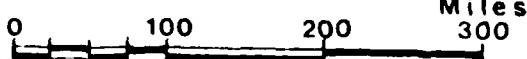
PLATE 1



LEGEND

- Waterways
- - - State Boundaries
- Cities ★ Capital
- ██████████ Clinton Lake Project

SCALE



Prepared for U.S. Army, Corps of Engineers
Kansas City District

VICINITY MAP

of
**CLINTON LAKE,
KANSAS**

CONTRACT NO.
DACW41-78-C-0054

APPROVED
CHL 5/17/79

DATE
5/17/79

DRAWN BY
John J. Gandy

Description of the Study Area

Clinton Lake is located in northeastern Kansas, as shown in Plate 1. The project's western, upstream boundary is 14.4 kilometers (9 miles) southeast of Topeka while the dam site is 4.8 kilometers (3 miles) southwest of Lawrence. The towns of Stull and Clinton border on the project area. The major portion of the lake and recreation area will be in Douglas County, with a small, western section located in Shawnee County.

The conservation pool of Clinton Lake will flood approximately 7,000 acres of the Wakarusa River Valley and its tributaries, Coon, Deer, Dry and Rock Creeks. During high water periods, lower portions of Elk and Camp Creeks may also be inundated. The Wakarusa River is a perennial stream and a tributary of the Kansas River, which in turn empties into the Missouri River.

ENVIRONMENTAL SETTING

Climate

The Clinton Lake area lies within the Humid Continental Climatic Zone. At Lawrence, Kansas, 4.8 kilometers (3 miles) from the dam site, the mean annual precipitation averaged 83 centimeters (35 inches) for the period 1941 to 1970. Nearly three-fourths of the annual precipitation fell from April to October during the growing season of 196 days. The mean annual temperature was 14°C (56°F), ranging from a mean monthly low of 0.3°C (32°F) in January and a high of 27°C (81°F) in July. Frontal and anticyclonic storms may move across the Clinton Lake area in any season (USDA 1977). The tornado belt occupies the area, and destructive tornados have traversed it in 1917 and 1964 (Parker and Laird 1976).

During the Wisconsinan glaciation, the climate was a few degrees cooler and less seasonal than at present. The Wisconsinan climate was characterized by milder winters, cooler summers and possibly more precipitation. In addition, the length and timing of the seasons differed greatly from the present (Martin and Neuner 1978; Slaughter 1968).

Starting about 10,500 B.P., the climate of northeastern Kansas became drier, warmer or both. This climatic change reached its maximum intensity from 7000 B.P. to 5000 B.P. It resulted from an increase in the strength of the westerlies, which intensified the rain shadow produced by the Rocky Mountains over most of Kansas (Webb and Bryson 1972; Wendland 1978). The drier or warmer climate, however, did not render uninhabitable the Clinton Lake area or the Great Plains to the west (Reeves 1973). The climate cooled and moistened to become similar to the area's historic climate by 4000 B.P. (Wendland 1978).

Between 4000 B.P. and the present, northeastern Kansas had minor fluctuations in climate. Pollen data from the Hackberry Lake pollen site in central Nebraska suggest that in north-central Kansas the climate was relatively dry from 4000 B.P. to 3500 B.P. and relatively moist from 1260 B.P. to 860 B.P. By 400 B.P., the climate of northeastern Kansas and most of the Interior Plains had cooled to approximately 1°C below present temperatures and remained at that level until 100 B.P. (Sears 1961; Wendland 1978).

Physiography

The Clinton Lake area lies partly within the Dissected Till Plains and the Osage Plains of the Central Lowlands Physiographic Province defined by Fenneman (1939). USGS quadrangle maps (1970, 1975) show that the area is dominated by the eastward trending valley of the Wakarusa River. Uplands of deeply dissected Pennsylvanian System rocks and Pleistocene surficial sediments surround the Wakarusa River Valley. The uplands rise as much as 55 meters (180 feet) above the Wakarusa River floodplain.

The weakly meandering Wakarusa River drains the project area and carries the water toward the east into the Kansas River. The valley floor is 0.8 to 1.2 kilometers (0.5 to 0.8 mile) wide. It consists of a low floodplain and the Newman Terrace, which is about 6 meters (20 feet) above low water level (Ibid.).

Geology

The interstratified sandstones, shales and limestones of the Pennsylvanian System underlie all of Douglas and Shawnee Counties. Of these westward dipping strata, the Lawrence Shale, Oread Limestone, Kanwaka Shale, Deer Creek Limestone and Lecompton Limestone outcrop within or adjacent to the survey area. Of the five formations, only the Deer Creek and Oread Limestones contain chert-bearing limestone (O'Conner 1960).

The Oread Limestone consists of four limestone and three shale members. Only the Plattsmouth and Toronto Limestone Members contain chert. Scattered, "yellow brown" weathering nodules of chert occur in the Toronto Limestone. "Blue-gray" fossiliferous chert occurs as scattered nodules in the middle of the 5.5 meter (18 foot) thick Plattsmouth Limestone Member. The chert and limestone contain fusulinids, crinoids, brachiopods, mollusks, corals and algae. To the north in Nebraska, the Plattsmouth Limestone Member is a source of a fusulinid-rich variety of Nehawka Flint (Carlson and Peacock 1977a).

In southwestern Douglas County, the Deer Creek Limestone contains some chert. In Nebraska the Deer Creek Limestone is a source of Nehawka Flint (Ibid.).

Within the uplands, patches of pre-Illinoian glacial sediments overlie bedrock. The sediments consist of glacial till with associated lake and fluvial sediments deposited at the margin of a pre-Illinoian ice sheet. Within the study area, erosion has left only a thin layer of glacial sediments intact on small upland tracts. The eroded material has been redeposited and mixed with other sediments in the stream valleys. As a result of the mixing, some of the post-Illinoian alluvium contains gravel with chert and quartzite from as far away as Wisconsin and Iowa. Within the study area, the glacial till is most extensive and best exposed on the upland around Clinton and Bloomington (Ibid.).

During the Illinoian and Wisconsinan glaciations, the prevailing winds deposited silt and clay as a thin blanket of sediments, called loess, over the Clinton Lake area. Since deposition, erosion has removed most of the loess blanket, leaving only scattered patches of it in the area (Ibid.; USDA 1970, 1977).

The Wakarusa River deposited alluvium during the Illinoian glaciation to form the Bull Creek Terrace. The alluvium consists of at least 23 meters (70 feet) of sand, mud and deeply buried gravels. The Wakarusa River later eroded a deep valley down to bedrock through these sediments (O'Conner 1960).

During the Wisconsinan glaciation, the Wakarusa River again filled its valley to form the Newman Terrace. The Newman Terrace deposits make up about 90% of the area of the present-day floodplain, with recent alluvium making up about 10%. This terrace surface varies in height, but averages about 20 feet above low water level in the major streams. Floods still raise the Newman Terrace by slight vertical accretions. The gradual accretion of this terrace with fine textured sediments similar to underlying materials may explain the virtual absence of paleontological remains (Ibid.).

Soils

The soils in the Clinton Lake area have formed in a variety of materials, principally alluvium, bedrock and glacial sediments (USDA 1970, 1977).

Except for the poorly drained Wabash silty clay loam, the alluvial soils are well drained, fine or medium textured soils. The alluvial soils are generally restricted to the thick alluvium of the terraces and floodplain. In the Floodplain Ecological Zone, the soils potentially contain buried or stratified sites. Examples of alluvial soils are Reading and Kennebec silt loam (Ibid.).

Residual soils cover most of the slopes and uplands of the survey area. These soils are well drained, fine to medium textured soils which may contain significant amounts of sand and rock fragments. Bedrock rests under the thin blanket of residuum in which the soils have developed. Examples of residual soils are Martin silty clay loam, the Vinland complex, Oska silty clay loam and Stony steep land. The Oska silty clay loam and the Stony steep land might contain rare residual chert (Ibid.).

Small remnants of glacial sediments produced silty, clayey and occasionally gravelly soils. These soils occur on the upland ridges and slopes of the survey area. They are well drained and generally deep. Soils like the Woodson silt loam and Morrill clay loam often contain gravel foreign to the area derived from the glacial till or alluvium in which they have developed. If developed in loess, these glacial soils are generally silty and lack gravel, as in the case of Gymer silt loam (USDA 1977).

Ecosystems

At the time of contact and the beginning of settlement, the project area had a typical tall grass prairie vegetative ecosystem with most or all of the uplands and some slopes having relatively dense stands of tall and mid-grasses mixed with forbs, native legumes and scattered shrubs. Within the larger area of grassland, hardwood forest extended in fingers and patches along the floodplains of perennial and most sizeable intermittent streams.

Most of the native grass species are still found to some extent in the area. The predominant grasses were originally bluestems, prairie cordgrass, Indiangrass, bromegrasses, three-awns, panicums and lesser amounts of several other species. For both grazing and hay, the predominant grass species in the area is now smooth bromegrass. This species introduced from Europe gives high yield and is more easily and cheaply established on former prairie lands than most native species (Shelford 1963).

All of the tree species which originally covered most of the floodplains remain, although their relative abundance has probably changed considerably. The floodplains originally contained relatively dense stands of walnut, hickories, ash, elms, hackberry, honey locust, oaks and box elder (Ibid.).

The most important herbivorous mammal present at contact, the bison, was exterminated in this part of Kansas prior to 1870 (Socolofsky and Self 1972). Most other species, such as jackrabbits, cottontail rabbits and white-tailed deer, are still present. Deer may have actually increased, as the browse on which they largely feed has been increased due to the invasion of formerly cultivated lands by woody plant species.

Presently small mammals are still abundant in the area. Such species as cottontail rabbits may be more abundant than they were over a hundred years ago before the introduction of cultivated legumes such as alfalfa, soybeans and clovers as a food source and before the development of hedgerows and fences as cover (Shelford 1963).

The flora of northeastern Kansas has changed over the last 16,000 years. During the last of the Wisconsinan glaciations, spruce forest dominated north-central Kansas. By 11,500 B.P., mixed prairie and deciduous forest with ironwood and hazelnut replaced the spruce forest. Because of further climatic desiccation, the prairie completely took over the flat uplands from the deciduous forest by 9900 B.P. Forest survived mostly in the moister bottom-lands, while prairie covered the uplands and valley slopes.

Since approximately 5000 B.P., deciduous forest spread westward from Missouri and a prairie border of mixed prairie and forest developed in northeastern Kansas. Tree species, particularly elm, hackberry, honey locust and osage orange, have invaded some former grassland in the Clinton Lake area. The decreased frequency of prairie fires, increased precipitation and, to a small degree, disturbance of grass cover have resulted in the spread of these trees (Gruger 1973; F. King 1977; Wright 1970).

Prior to 11,000 B.P., extinct musk ox, giant beaver, reindeer, large deer, mammoth, camel, horse, panther and other fauna inhabited the spruce forests of northeastern Kansas. After 11,000 B.P., these animals disappeared along with the spruce forest, and modern bison predominated as the prairies developed and expanded. Before 11,000 B.P. bison was a relatively rare part of the fauna (Martin and Gilbert 1978; Martin and Neuner 1978).

Although not much is known about post-glacial faunas of northeastern Kansas, numerous faunal remains recovered from the Archaic occupations at the

LEGEND



Floodplain



Second Terrace



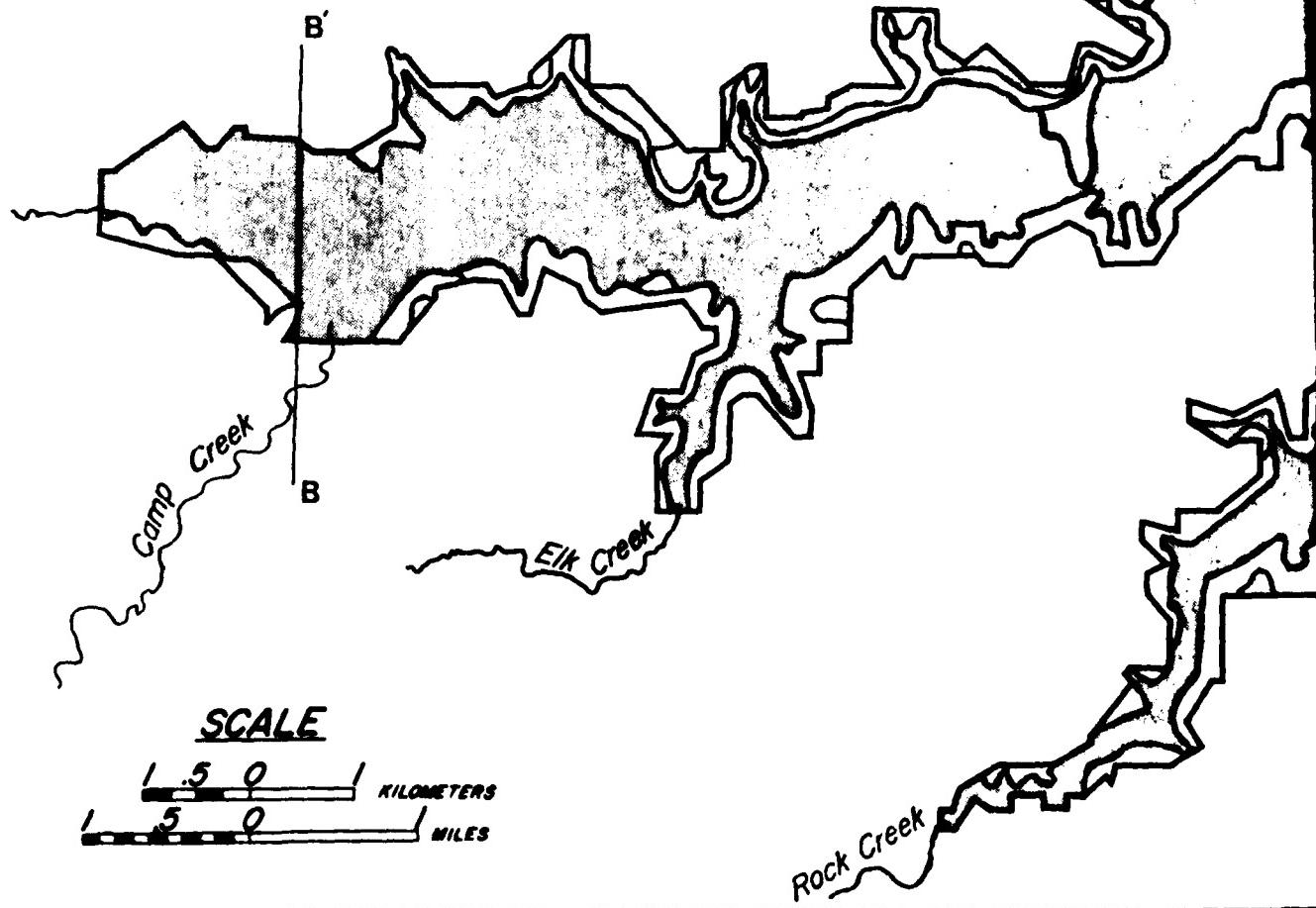
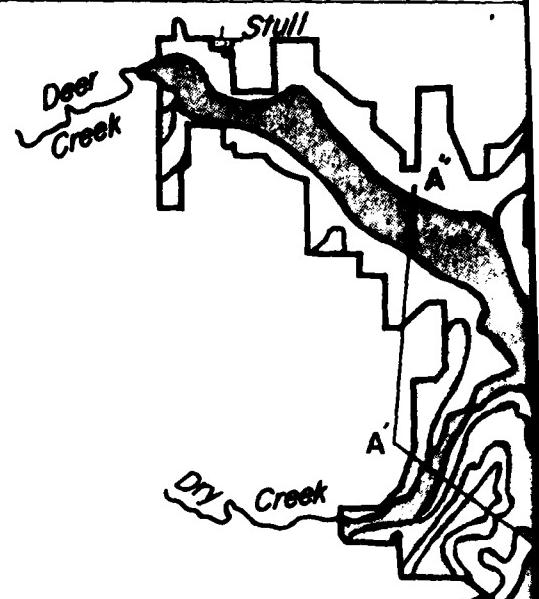
Upland Prairie



Wooded Slope

A — A' Location of Cross Section shown in Figure 2

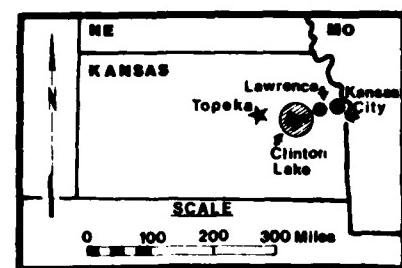
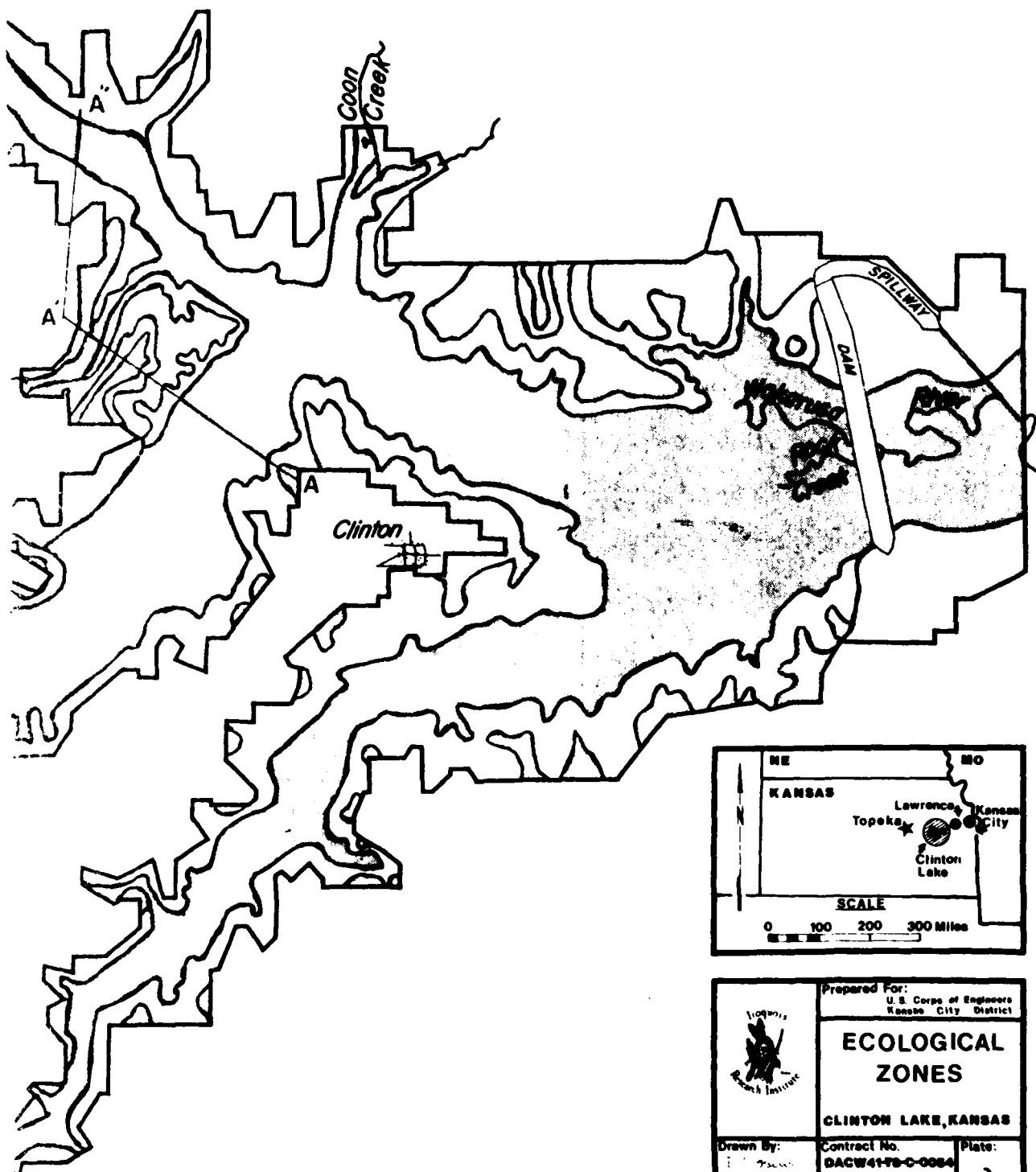
B — B' Location of Cross Section shown in Figure 1



SCALE

1.5 0 1 KILOMETERS

1 5 0 MILES



	Prepared For: U.S. Corps of Engineers Kansas City District	
ECOLOGICAL ZONES		
CLINTON LAKE, KANSAS		
Drawn By: [Signature]	Contract No. DAGW4178-C-0084	Plate: 2
Approved By: [Signature]	Date: AUGUST 1, 1970	

Coffey site date from 5100 B.P. to 5300 B.P. Except for the Great Plains Toad, all species of animals recovered are found presently or have been found historically in the area of the Coffey site. The mammals present at the site consisted of bison, deer, raccoon, tree squirrel, striped skunk, ground squirrel, Plains pocket gopher, Eastern woodrat, Eastern mole, cottontail rabbit, and a dog or coyote. All of the mammals but the Plains pocket gopher, which could be intrusive, were probably used for fur, food or both. Remains of various ducks and geese, one hawk, and several box and soft-shelled turtles were recovered along with catfish, drum, chub, gar, sucker and other fishes (Schmits 1976).

Ecological Zones

On the basis of geomorpology and flora, four ecological zones are recognized in the project area. As illustrated in Plates 2 and 3 and Figures 1 and 2, they are the Floodplain, Second Terrace, Wooded Slope and Upland Prairie zones.

The Floodplain Ecological Zone consists of the modern floodplain, including the surface of the Newman Terrace. It contains soils developed in relatively young alluvium which may contain buried or stratified sites. In prehistoric times this area was covered by a native deciduous floodplain forest dominated by elm, cottonwood, walnut, hickory, ash and hackberry (Schmits 1976; Shelford 1963).

The Floodplain Ecological Zone contained a variety of biotic resources from native aquatic and floodplain forest sources. From the streams, rivers, ponds, lakes, and their margins, the inhabitants could obtain fish, waterfowl, clams, soft-shelled turtles, chenopods, bulrush, sedges and other edible plants and animals. The floodplain forest contained numerous animals such as fox, squirrel, white-tailed deer, box turtle, opossum, raccoon and others. Plants such as hackberry, red maple, box elder, grapes, sedges, goosefoot, pawpaw and mulberry supplied edible nuts, seeds, fruits, leaves and stalks (Ibid.).

The Second Terrace Ecological Zone contains the older terrace surfaces of the Wakarusa River. Alluvial soils predominate in this ecological zone. Except where thick deposits of colluvium occur, buried or deeply stratified sites should not be present. This area was covered by an upland deciduous forest which contained more oak and hickory than in the adjacent Floodplain Ecological Zone.

Except for the lack of aquatic resources, the Second Terrace Ecological Zone differed little from the Floodplain Ecological Zone in native animal resources. The floral resources of the two ecological zones differed in kind, but not in abundance. Food sources available in the Second Terrace Ecological Zone consisted of acorns, hickory nuts, hackberries, honey locust pods, blackberries, dewberries, hazelnuts, pokeweed, grapes, sorrels and several others (Schmits 1976).



KANSAS STATE HISTORICAL INSTITUTE PHOTO

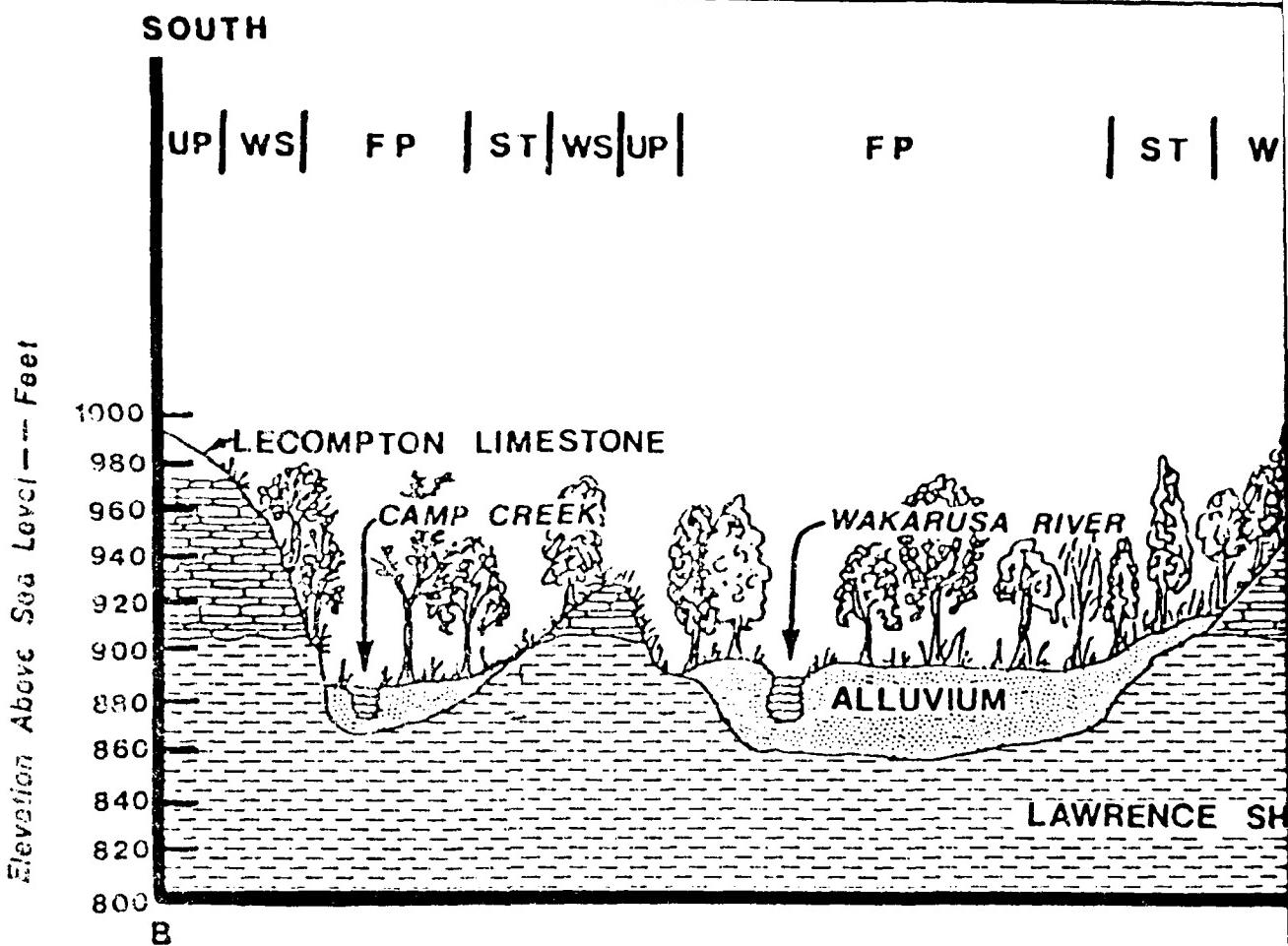
PLATE 3

The eastward view of the Wakarusa River Valley shown in this 1978 photograph illustrates all the ecological zones and the major geomorphological features of the valley. The foreground area is upland prairie which in this area slopes gradually down to a second terrace on the left of the photograph. The light colored area in the upper right is a portion of the floodplain of the Wakarusa River bordered in the right background by an area of wooded slope.

The third ecological zone is the Wooded Slope Ecological Zone. It consists of forest-covered slopes which rise from the Floodplain and Second Terrace Ecological Zones to the uplands of the Osage Plains. Thin residual soils cover the forested slopes. The native vegetation consisted of oak and hickory with lesser amounts of walnut, basswood and the Kentucky coffee tree.

The biotic resources of the Wooded Slope Ecological Zone were the same as those of the Second Terrace Ecological Zone with some additions. The additional animals were cottontail rabbits, skunks and other animals which live on the forest-grassland border (Ibid.; Shelford 1963).

The Upland Prairie Ecological Zone consists of the small, relatively level parts of the uplands within the survey area. A typical upland prairie, which is rooted in shallow residual soils derived from bedrock or glacial sediment, covers this zone (Ibid.).



Geomorphological, Geological and Ecological the Wakarusa River Valley near the Confluence

Creek above Richland

Horizontal Scale - Feet

Horizontal Scale—Meters

9 2,000 4,000

17

1,000

LEGEND

FP - Floodplain - This area had a native vegetation of deciduous trees. Elm, cottonwood, walnut, hickory, ash and hackberry were the dominant species.

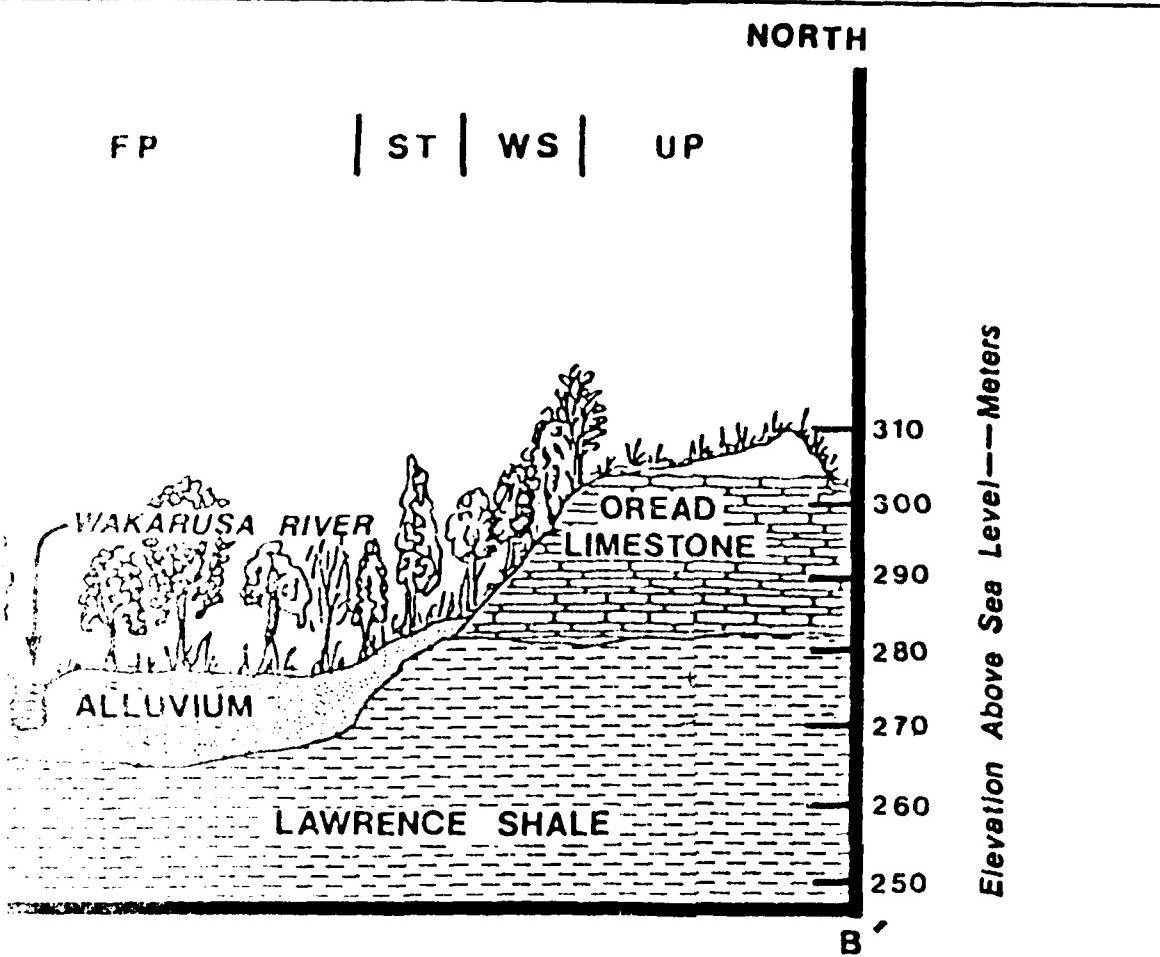
ST—Second Terrace — The second terraces had a native vegetation of deciduous trees with more oak and hickory species than the Floodplain.

WS - Wooded Slope - Depending
a native vegetation of oak,
nut, basswood and Kentucky

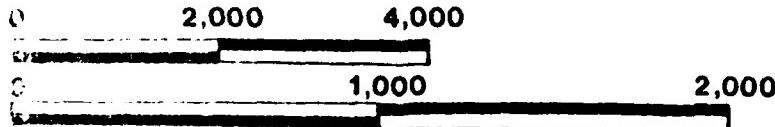
UP—Upland Prairie - The native grasses are mostly tall, by little and big bluestem, with some switch grass, and a few clumps of Indian grass. The flowers are mostly annuals, such as sunflower, associated with the grasses.



8/1/79



ogical and Ecological Section of y near the Confluence with Camp ove Richland



LEGEND

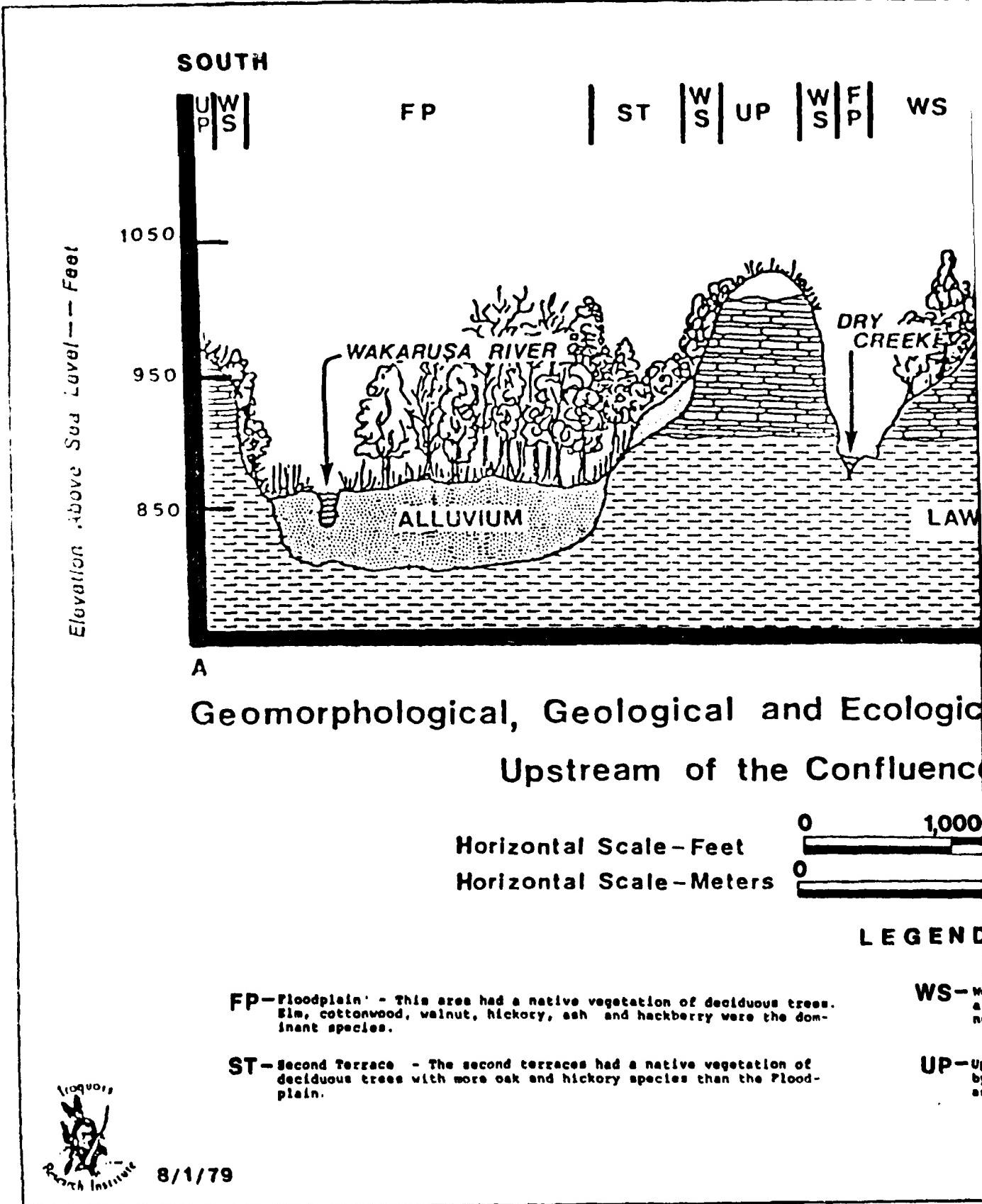
ST - Stream
UP - Upland

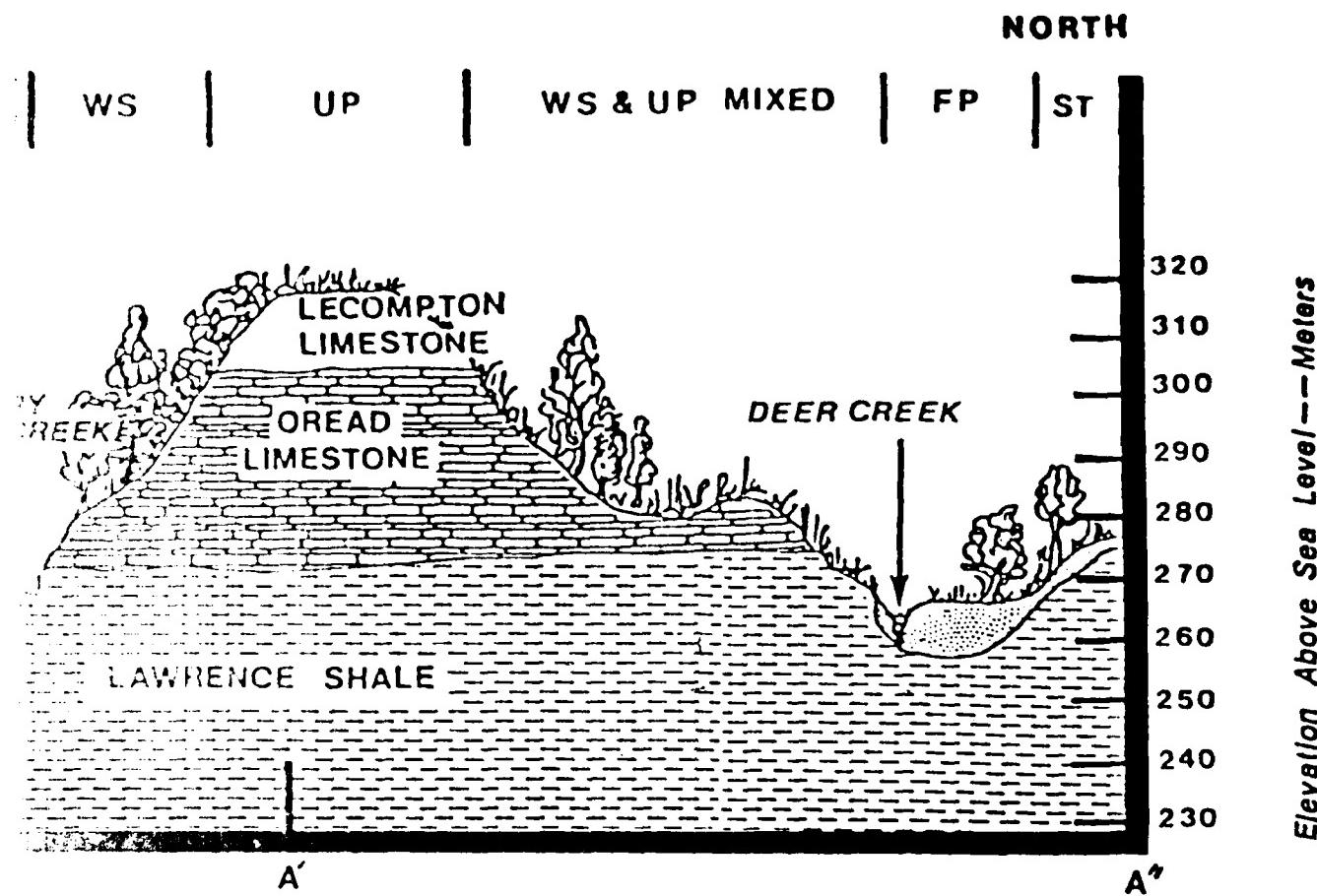
WS - Wooded Slope - Depending on depth of soil cover, these areas had a native vegetation of oak and hickory with lesser amounts of walnut, basswood and Kentucky coffee tree.

UP - Upland Prairie

UP - Upland Prairie - The native vegetation in this area was dominated by little and big bluestem, Indian grass and various forbs, such as sunflower, associated with the Tall Grass Prairie ecosystem.

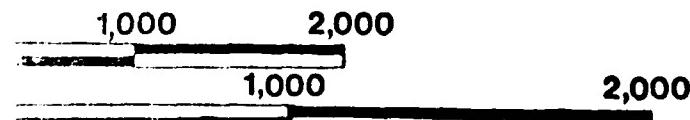
FIGURE 1





Ecological Section of the Wakarusa River Valley

Influence with Deer Creek



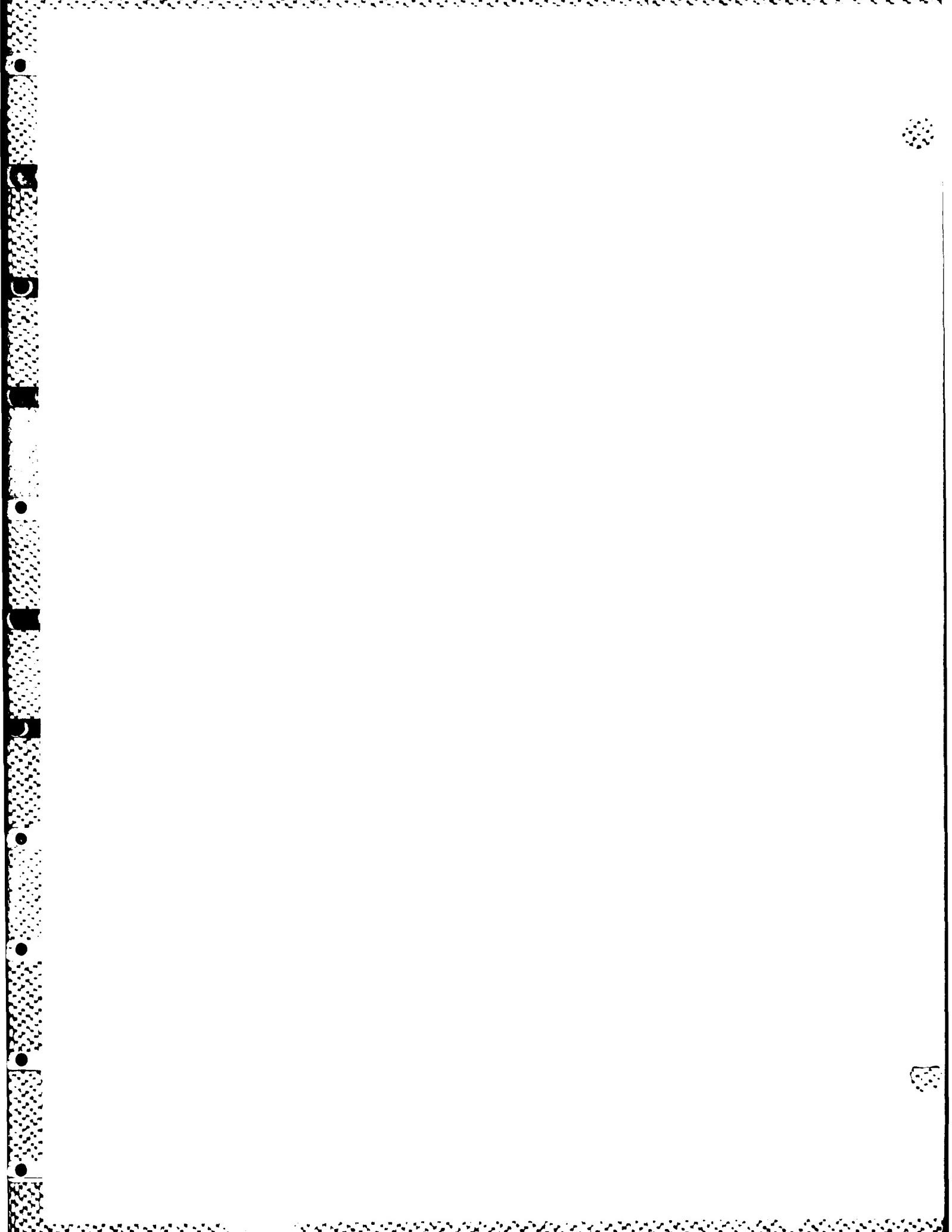
LEGEND

WS - Wooded Slope - Depending on depth of soil cover, these areas had a native vegetation of oak and hickory with lesser amounts of walnut, basswood and Kentucky coffee tree.

UP - Upland Prairie - The native vegetation in this area was dominated by little and big bluestem, Indian grass and various forbs, such as sunflower, associated with the Tall Grass Prairie ecosystem.

FIGURE 2

The Upland Prairie Ecological Zone at one time contained bison, black-tailed deer, box turtles, prairie chickens, jackrabbits and other prairie animals. Numerous plants would have been available for exploitation. Some of the available plants would have been wild onion, ground plum, six week fescue, foxtail barley, and witchgrass (Ibid.).



ARCHAEOLOGICAL BACKGROUND

Culture History of the Study Area

A summary of the prehistoric developments in the eastern Plains is complicated by the fact that no single integrative model has been employed to formally and chronologically order the region's prehistoric complexes. A great diversity of archaeological classificatory schemes, research interests and theoretical frameworks have existed, and continue to exist, for this area. Table 1 illustrates this diversity, showing classification schemes for the Plains (Lehmer 1971; Willey 1966), for smaller regions within the Plains (Caldwell and Henning 1978; Wedel 1959; Brown 1977), and for particular localities in Kansas and Missouri (Johnson 1968, 1974; Marshall 1972). See Gradwohl (1969) and Reynolds (1979a) for a detailed discussion of the history and development of archaeological systematics in the Central Plains.

The Midwestern Taxonomic System or MTS formed the original basis of archaeological systematics in the Plains and eastern United States (McKern 1939), and throughout the 1940's, 1950's and into the 1960's an attempt was made to order archaeological components in the Plains with respect to its formal taxonomy. Some archaeological components, however, were never formally placed within the hierarchical taxonomy of the MTS because data were lacking to permit the assignment of focus or aspect designations. Although ideally the MTS is purely a formal classificatory device, Gradwohl (1969) points out that spatial and temporal factors have played a subtle role in many classifications in Plains archaeology based ostensibly upon the McKern system.

Beginning in the 1950's, attempts have been made to explicitly include space and time in the systematics of Plains archaeology. The two temporal-cultural integrative systems most often employed have been those of Lehmer (1952, 1954, 1971) and Willey and Phillips (1958). As indicated by Caldwell and Henning (1978), the innovations represented by these two systems and their derivatives have not been universally adopted in Plains archaeology, and the MTS still has many adherents.

One of the major problems in Plains archaeology, therefore, is the difficulty surrounding the comparison of archaeological complexes defined using MTS criteria with those defined within the framework of other classificatory schemes. Together with the relative lack of deep, stratified deposits, the conflicting classificatory schemes employed in Plains archaeology have often resulted in particularistic descriptions of local phases or foci, amenable only to broadstroke temporal or spatial generalizations.

Based to a large extent upon the prehistoric patterns of the MTS defined in the eastern United States, the archaeological sequence in the Plains area, including eastern Kansas, has been divided into four broad divisions: Paleo-Indian, Archaic, Woodland or Plains Woodland, and Plains Village (*Ibid.*; Willey 1966).

TABLE 1
SELECTED ARCHAEOLOGICAL SEQUENCES IN THE PLAINS AREA

ABSOLUTE DATE	CENTRAL PLAINS (CALDWELL AND BENNING 1978)	NORTH-CENTRAL PLAINS (SEDEL 1959)	KANSAS CITY (ARFA 1974)	CLINTON LAKE (JOHNSON 1968)	S.E. KANSAS (MARSHALL 1972)	KANSAS ANTIQUITIES COMMISSION (BROWN 1977)	PLAINS (LUTHER 1971)	PLAINS (WILLEY 1966)	ABSOLUTE DATE
1500	MIDDLE CERAMIC CENTRAL PLAINS VILLAGE	OMAHA ASPECT	—	CLINTON PHASE	POMONA FOCUS	LATE CERAMIC	PLAINS VILLAGE	PLAINS VILLAGE	1500
1000	—	NEBRASKA ASPECT	STEEN KISKER FOCUS	—	DEER CREEK PHASE	MIDDLE CERAMIC	—	—	1000
500	—	—	LATE WOODLAND	WAKANUSA PHASE	WICHITA PHASE	EARLY CERAMIC	PLAINS WOODLAND	PLAINS WOODLAND	500
AD BC	PLAINS WOODLAND	—	KANSAS CITY (ARFA 1974)	—	—	—	—	—	AD BC
500	—	—	—	—	GROVE FOCUS	—	—	—	500
1000	—	—	LATE ARCHAIC	—	—	—	—	—	1000
1500	—	—	—	—	—	—	—	—	1500
2000	—	—	—	—	—	—	—	—	2000
2500	PLAINS ARCHAIC	—	—	—	—	—	FORAGING	—	2500
3000	—	—	—	—	—	—	—	—	3000
3500	—	—	MIDDLE ARCHAIC	—	—	—	—	—	3500
4000	—	—	—	—	—	—	—	—	4000
4500	—	—	—	—	—	—	—	—	4500
5000	—	—	—	—	—	—	—	—	5000
5500	—	—	—	—	—	—	—	—	5500
6000	—	—	—	—	—	—	—	—	6000
6500	—	—	—	—	—	—	—	—	6500
7000	—	—	—	—	—	—	—	—	7000
7500	—	PALEO-INDIAN	—	—	—	—	—	PALEO-INDIAN	7500
8000	—	—	—	—	—	—	PALEO-INDIAN	PALEO-INDIAN	8000
8500	LATE PALEO-INDIAN	—	—	—	—	—	PALEO-INDIAN	—	8500
9000	—	—	—	—	—	—	—	—	9000
9500	—	—	—	—	—	—	—	—	9500

— = indeterminate temporal boundary

In eastern Kansas, the Paleo-Indian Period is represented only by the scattered occurrence of fluted points in surface contexts. Based largely upon the occurrence of Paleo-Indian projectile point styles in association with the remains of Pleistocene megafauna in the High Plains and Southwest, the Paleo-Indian Period is often characterized as a stage of specialized big-game hunting. While this may be a valid characterization for the western Plains, an exclusive big-game hunting economy was probably less likely in the eastern United States, where a wide range of alternate resources were available (see Byrd and Neuman 1978).

There is a virtual absence of in situ Paleo-Indian remains in the eastern Plains. Many Paleo-Indian sites in the region may have been either destroyed by increased erosion or buried under fluvial deposits that accompanied the end of the Atlantic Climatic Episode. These events are suspected to account for the paucity of Paleo-Indian and early Archaic remains in western Missouri (Joyer and Roper, *in press*) and probably affected the archaeological record in eastern Kansas as well.

In surrounding regions, however, a number of sites containing projectile points or other artifacts in association with extinct Pleistocene fauna have been reported. The Twelve Mile Creek site in western Kansas, investigated in the late 19th and early 20th centuries, apparently contained projectile points in association with the remains of an extinct bison (Reynolds 1979b). Even earlier, artifacts and mammoths were reported in association at several spring sites along the Pomme de Terre River in western Missouri (Koch 1857). This report has not been substantiated by subsequent research (J. King 1975). Other Paleo-Indian kill sites in the regions surrounding eastern Kansas are represented by Plano style points in association with extinct bison at Lime Creek and Meserve in central and southern Nebraska, and Clovis points in association with the remains of a mammoth at the Domebo site in southwestern Oklahoma (Wormington 1957; Leonhardy 1966; Jennings 1974).

Although in much of the eastern United States the succeeding Archaic stage has been divided into three subperiods based largely upon stylistic changes in diagnostic projectile points, such a division is difficult to make in the Plains, especially with regard to the earlier Archaic complexes. The Archaic stage in the Plains has also been referred to as the "Foraging" tradition (Lehmer 1971) on the assumption that it represents a distinct shift from the supposed big-game hunting of the preceding Paleo-Indian stage.

Most evidence (Schmits 1976; Root 1979) suggests that the subsistence pattern of eastern Plains Archaic groups was oriented around seasonal exploitation of gallery forests and bottomlands, rather than grasslands. Exploitation of grassland fauna during the Archaic Period is indicated by the presence of an early Plains Archaic bison kill site as far east as Iowa (Agogino and Frankforter 1970) and by the scattered presence of bison remains in Archaic contexts throughout the eastern Plains. There is little evidence, however, for the focal exploitation of bison that appears to have characterized the subsistence pattern of certain northern Plains Archaic groups (Reeves 1973).

Although Archaic complexes and assemblages are scattered throughout the eastern Plains, they have generally resisted placement within either the MTS or the Willey and Phillips integrative models. In recent years, however, there has been notable progress in developing Archaic systematics in the eastern Plains.

The Nebo Hill phase (Shippee 1948; Reid 1980) has been recognized as a late Archaic complex in the eastern Plains which shows evidence of relationships with the Sedalia and Titterington phases to the east in Missouri and Illinois. Recent radiocarbon determinations from the type site of Nebo Hill in western Missouri place the complex at roughly 1600 B.C. (Reid 1980). Although the central area of the Nebo Hill phase appears to be located in the vicinity of Kansas City, characteristic Nebo Hill lanceolate points have been recovered as far west as the Coffey site in Pottawatomie County, Kansas, as far north as central Iowa, and as far east as Springfield, Illinois (Ibid.). Nebo Hill complexes have also been recently recognized in the Hillsdale Reservoir in Miami County, Kansas (Blakeslee, personal communication).

The Munkers Creek complex has been defined in northeast Kansas (Witty 1969) based upon an excavated assemblage at the William Young site. Among the artifacts presumably characteristic of the Munkers Creek complex are thick stemmed points possibly made from lanceolate preforms, curved bifacial knives, and Clear Fork gouges, which occur in most late Archaic contexts in the southern and eastern plains and prairies. Radiocarbon dates recovered from the Munkers Creek component suggest a possible range from about 3500 B.C. to 1000 B.C. (Ibid.). Possible Munkers Creek artifacts have also been recovered at the Coffey site, also in northeast Kansas (Schmits 1976).

Excavations at the Snyder site in south-central Kansas (Grosser 1973) have resulted in the recognition of three tentative Archaic phases underlying a Plains Woodland component. A late Archaic and possibly transitional Archaic-Plains Woodland component is defined as the Walnut phase, dated tentatively between 1200 B.C. and A.D. 1. The Walnut phase is significant in that small, corner notched points, thought possibly to be arrow points, were recovered from isolated Walnut phase levels. These dates, if accepted, provide evidence for the early use of the bow and arrow in essentially Archaic contexts in eastern Kansas (Ibid.).

An earlier Archaic complex at the Snyder site is defined as the El Dorado phase. This phase is characterized by long, narrow, stemmed points and other chipped stone tools. The El Dorado phase has been tentatively dated to fall between 2000 B.C. and 1400 B.C., based upon a single radiocarbon determination (Ibid.).

Underlying the El Dorado phase was a possible complex defined as the Chelsea phase, estimated to date between 2800 B.C. and 2000 B.C. Projectile points recovered in Chelsea phase levels included squat, corner notched points and a longer, more broad, corner notched form (Ibid.).

An undated, but presumably rather late, Archaic manifestation in northeastern Oklahoma and southeastern Kansas has been termed the Grove focus

(Bell and Baerreis 1951; Marshall 1972). The Grove focus is characterized by a variety of large, contracting and expanding stemmed points.

Unnamed Archaic complexes occur throughout Kansas and Oklahoma, and except for when they occur in stratigraphic or dated contexts, they "float" in time. These generalized Archaic complexes are characterized by the presence of large, side notched points such as Ensor and Ellis; Gary, Langtry and other contracting stemmed points; and several large, expanding stemmed varieties. Many of these points also occur in Plains Woodland contexts, however, so their utility as chronological markers is limited.

Due partially to the widespread introduction of ceramics into the artifact inventory in the succeeding Plains Woodland Period, the recognition of specific, local phases and foci becomes easier. In view of the relative lack of well-stratified Plains Woodland components in many areas of the Southern and Central Plains, however, there is still much uncertainty concerning the detailed chronology of the cultural interrelationships of these complexes.

In much of the eastern United States, a tripartite division of the Woodland pattern is recognized. With the exception of the "Hopewellian" or Middle Woodland manifestations in the Kansas City area (Wedel 1959, 1961; Johnson 1976) and in scattered areas of southeastern Kansas (Marshall 1972), northeastern Oklahoma (Bell and Baerreis 1951) and north-central Oklahoma (Bastian 1969), the eastern nomenclature is of little use in temporally or formally ordering Plains Woodland complexes.

The Hopewellian complex in the Kansas City area extends roughly from Kansas City north to Saint Joseph along the Missouri River and westward into northeastern Kansas. The "Hopewellian" nature of this complex is most visible near Kansas City at large villages like the Renner site, 23PL1. In the MTS, Hopewellian material near Kansas City has been designated the Renner phase. Among the Hopewellian traits present in the Renner phase are zoned and rocker stamped pottery; platform pipes; large, broad based, expanding stemmed points; and earthen burial mounds containing stone lined chambers (Willey 1966; Wedel 1961). The Missouri floodplain is quite wide between Kansas City and Saint Joseph, and some cultivation of plant foods was probably practiced. The evidence indicates, however, that corn and squash horticulture was never a significant factor in Kansas City Hopewell subsistence (Johnson 1976).

Kansas City Hopewell culture persisted from about A.D. 1 to A.D. 500, when it was superseded by late Plains Woodland groups occupying small, widely spaced settlements. At this time, small arrow points appear in the artifact inventory. Johnson (*Ibid.*) has suggested that the dispersal of population in the late Plains Woodland Period is a reflection of increased reliance upon slash and burn agriculture, but there is little direct evidence for such a subsistence shift.

More attenuated "Hopewellian" influences are apparent in southeastern Kansas and northeastern Oklahoma. The Cooper complex, as the Oklahoma variant is called, contains zoned, dentate stamped pottery; large, broad based, expanding stemmed points; clay figurines; and isolated trade sherds from the

Kansas City area (Bell and Baerreis 1951). The southeastern Kansas Middle Woodland material has been grouped into two phases, Cuesta and Hopewell, both of which are seen as exemplifying the widespread Havana tradition (Marshall 1972). The Hopewell phase is apparently very short-lived. The Cuesta phase is identified by a variety of dentate stamped ceramic styles and a mixture of large, contracting and expanding stemmed points together with small, corner notched points. Radiocarbon dates suggest a span of roughly A.D. 700 to A.D. 1050 for the Cuesta phase (Ibid.). Other scattered Middle Woodland or "Hopewellian" ceramics have been recovered from the El Dorado Reservoir in south-central Kansas (Grosser 1973) and the Kaw Reservoir in extreme north-central Oklahoma (Bastian 1969; Young 1978).

Recognizing that the tripartite Woodland chronology established in the eastern United States is only partially applicable in the Plains, the Kansas Antiquities Commission avoids the use of the term "Woodland" altogether by referring to these complexes as "Early Ceramic" (Brown 1977). In this report, the term "Plains Woodland" is employed to refer to all of the generalized non-Middle Woodland complexes recognized in the Plains.

For the most part, Plains Woodland occupations are found in the comparatively wooded river and stream valleys, and appear to represent a primary adaptation to bottomland and gallery forest environments. Evidence for horticulture is scanty, but maize has been reported in certain late Plains Woodland contexts (Barr 1966).

A number of Plains Woodland complexes are recognized in eastern Kansas. The Keith focus, originally defined in Nebraska (Kivett 1949), is typical of Plains Woodland complexes in Kansas west of the Flint Hills. Keith focus sites are thought to consist of small numbers of simple, perishable houses, with little evidence for long-term occupation (Wedel 1961). Relatively large ossuaries characterize the burial patterns of Keith focus peoples, and pottery is typically a sand or calcite tempered, cord marked ware. Among the lithic artifacts characteristic of the Keith focus are small to large, stemmed and barbed projectile points (Kivett 1953).

In east-central Kansas, an important Plains Woodland manifestation is the Greenwood phase (Reynolds 1979a). The Greenwood phase artifact inventory includes limestone tempered, cord marked pottery and large and small, stemmed and corner notched points. Sites are small and consist of small, perishable dwellings adjacent to dependable streams. Some evidence for the existence of smaller, special purpose campsites also exists (Ibid.).

The Grasshopper Falls phase in northeast Kansas represents another Plains Woodland complex (Ibid.). Like the Keith focus and the Greenwood phase, this complex consists of small settlements located on terraces adjacent to secondary streams. The artifact assemblage recovered from Grasshopper Falls sites conforms to the general Plains Woodland pattern of cord marked and smoothed over pottery and large and small, expanding stemmed or corner notched points. As with the other Plains Woodland complexes in Kansas, a basically hunting and gathering economy is presumed for the Grasshopper Falls phase (Ibid.).

Johnson (1968) has defined three phases in the Clinton Reservoir area based upon his work there. These phases are summarized in Table 2. Two of them, the Wakarusa phase and the Deer Creek phase, belong to the Plains Woodland Period. The Wakarusa phase is characterized by grit and sand tempered, cord marked pottery and large, stemmed and corner notched points. Wakarusa phase houses appear to be small, isolated surface structures manufactured of a pole framework covered with wattle and daub (Ibid.). The Deer Creek phase also is characterized by thick, grit tempered, cord marked pottery, but in addition to the large points reported from the Wakarusa phase, small, corner notched points are also included in the assemblage. A single rocker stamped sherd, presumably associated with Kansas City "Hopewell" components to the northeast, is also reported from Deer Creek contexts. Based

TABLE 2
CULTURAL PHASES DEFINED IN THE CLINTON LAKE AREA*

NAME	WAKARUSA	DEER CREEK	CLINTON
Type Site(s)	Kay, Schroeder (140027).	Anderson (140032).	Parcher (140019), Anderson (140032).
Type Period = Cultural Affiliation	Circa A.D. 1 - 1000 Similar to Plains Woodland.	Began slightly later than Wakarusa phase.	Circa A.D. 1000 - 1500 Similar to Central Plains.
Cultural Extent	Unknown.	Unknown.	Length of Wakarusa?
Diagnostic Ceramics	Jar forms with everted bases, slightly outcurved rims, rounded lips; overall cord marked exterior; grit and sand temper.	Thick, cord marked, with abundant grit tempering (similar to Wakarusa).	Cl. tubular jars with straight or flaring rims, bases, crimped rims. Cord marked and untempered cord marked exterior; clay or shale temper; side angular grit temper.
Diagnostic Stone Tools	Large stemmed or corner notched points, ovate knives, end scrapers, end and side scrapers, choppers, utilized flakes, handstones, and hammerstones, local cherts.	Large stemmed and corner notched points (similar to Wakarusa). Scalloped points (small, corner notched). Local cherts.	Small, triangular, side notched, side and basal notched, or unnotched points. Small convergent-based knives, end scrapers, small side scrapers, celts, handstones, grinding slabs, hammerstones, elbow pipes (?), local cherts.
Subsistence	Hunting (deer, some bison), gathering, possibly some agriculture.	Unknown (use of bow and arrow).	Hunting, gathering, and corn agriculture.
House Type	Percussion pole framework with wattle and daub cover. Interior, central, basin, stepped hearths, and straight-walled storage pits.	Unknown.	Pole framework with wattle and daub cover. Circular, shallow, basin-shaped, or a ferocut storage pits. Basin-shaped hearths.
Settlement Pattern	Isolated surface houses on slight rises on first terraces above minor watercourses.	Unknown.	Houses built in close proximity on separate slight rises on first terraces of minor watercourses.
External Cultural Contacts	Unknown.	For Wakarusa, red sherd suggests trade with Kansas City Hopewell (circa A.D. 1 - 500).	Some shell tempered pottery indicates trade with or interaction w/ Mississippian groups.

*After Johnson (1968).

upon the occurrence of small points, Johnson suggests that the Deer Creek phase may partially postdate the Wakarusa phase (Ibid.).

Many unnamed Plains Woodland complexes occur elsewhere in Kansas and into north-central Oklahoma. These complexes are generally characterized by a wide variety of simple, cord marked and occasionally smooth pottery wares; large, expanding stemmed points; and small, corner notched points. In Oklahoma, contracting stemmed points are the dominant large point style, and cord marked pottery is often relatively unimportant. Certain of these northern Oklahoma Plains Woodland components yield comparatively early radiocarbon determinations in association with arrow points, placing typologically late Plains Woodland assemblages into an A.D. 150 - A.D. 400 period (Hartley 1974; Rohrbaugh 1974).

Beginning at about A.D. 1000, the Woodland pattern in portions of the eastern United States was gradually replaced by the Mississippian pattern. In certain areas of the riverine Midwest and the Southeast, environmental conditions allowed the relatively intensive cultivation of maize, beans and squash, in addition to a wide variety of native North American cultigens. In these areas, socio-cultural integration reached a relatively high level, resulting in the formation of large chiefdoms or incipient states (Morse and Morse 1977; O'Brien 1972).

Probably due to environmental constraints (Roper 1978), fully developed Mississippian complexes never penetrated into the eastern prairies or plains. Some Mississippian contacts, however, may have occurred in the Central and Southern Plains (O'Brien 1978; Bell and Baerreis 1951).

O'Brien (1978) argues that the Steed-Kisker focus of the Central Plains tradition represents an outright migration of Mississippian farming peoples into the wide valley bottoms in the Kansas City area, but others (Wedel 1978; Henning 1978) take a more conservative view, noting the essential similarity of Steed-Kisker sites to other Central Plains complexes. With the possible exception of the Mississippian ceramic styles present at Steed-Kisker, direct Mississippian influences on Central and Southern Plains cultures are very limited, although Caddoan influences are present on some Southern Plains village groups in Oklahoma (Bell and Baerreis 1951).

In the eastern Plains, the Woodland pattern was gradually replaced by the Plains Village pattern (Willey 1966) during a time period roughly equivalent with the rise of Mississippian culture in the East. Compared to the earlier Woodland complexes, Plains Village sites are relatively large, permanent or semi-permanent hamlets or villages supported to some extent by the cultivation of maize, beans and squash. Hunting and gathering remained important in the subsistence pattern of most Plains Village groups, however, and there is evidence for group fission and fusion in response to the seasonal availability of wild food resources (Henry *et al.* 1979). As opposed to the earlier Woodland exploitative patterns, a much greater utilization of grassland fauna characterized most Plains Village cultures.

In central and eastern Kansas, the Plains Village pattern is typically represented by sites of the Central Plains phase (Wedel 1959). Recently, the

term "tradition" has come into use to replace the old MTS "phase" concept in referring to the Central Plains taxon (Lehmer 1971; Caldwell and Henning 1978). In order to avoid confusion with the use of the term "phase" in the Willey and Phillips scheme, the term "tradition" is employed in this report as a substitute for the MTS "phase."

Central Plains-like complexes have been reported from north-central Kansas yielding radiocarbon determinations as early as A.D. 600 to A.D. 900 (Steinacher and Ludwickson 1972), suggesting that the tradition evolved *in situ* from local Woodland antecedents, rather than by direct stimulation from Mississippian cultures. This interpretation is supported by the presence of apparently transitional Woodland-Plains Village complexes such as the Custer focus in Oklahoma (Hofman 1978) and the Pomona focus in eastern Kansas (Marshall 1972; Witty 1967).

In eastern Kansas, the Plains Village pattern includes a number of local variants. The Nebraska aspect is located along the Missouri River in northeastern Kansas and eastern Nebraska (Wedel 1961). Extending to the south into eastern Kansas is the Smoky Hill phase (*Ibid.*). The Pomona focus, which appears to begin as a transitional Woodland-Plains Village complex, continues well into the Plains Village Period and exhibits many Plains Village traits.

These complexes have many traits in common, although they are distinguished by differences such as the predominance of smooth pottery in the Nebraska aspect and cord marking in the Pomona focus and Smoky Hill phase, the apparent absence of Central Plains tradition earth lodges in the Pomona focus, and the generally higher incidence of "Mississippian" traits in the Smoky Hill phase (Caldwell and Henning 1978). Shared traits include partial dependence upon the cultivation of maize, squash and beans; unplanned villages, hamlets and small homesteads situated on bluffs or ridges overlooking perennial streams; and the introduction of small, triangular, side notched arrow points, quite distinct from the corner notched types present in the Plains Woodland complexes. Plain and cord marked pottery predominate in these complexes, and shell tempering occurs in some contexts.

Related to the Central Plains tradition is the Oneota aspect in the Prairie Peninsula of western Iowa, which exhibits evidence of interaction with Central Plains and Mississippian groups (*Ibid.*).

The Clinton phase has been defined as a Plains Village complex in the immediate project vicinity (Johnson 1968). Clinton phase settlements appear to consist of small, isolated houses built in close proximity to one another on slight rises above small water courses, but the houses appear to bear little similarity to classic Central Plains tradition earth lodges (*Ibid.*). Clay, shale or grit tempered pottery exhibiting cord marked or plain surfaces occurs. There is some evidence for contact with Mississippian cultures to the east and south in the occasional presence of shell tempered pottery (*Ibid.*). The characteristic projectile points are small, side notched, basal notched and unnotched triangular points. The Clinton phase bears a close resemblance to the Pomona focus (Witty 1967), and may also represent a transitional Plains Woodland-Plains Village complex that continues well into the Plains Village Period.

At the time of Coronado's 1541 entrada into western and central Kansas, much of the central and southern portion of the state was apparently occupied by one or more bands of the Wichita tribe (Bell *et al.* 1967). Early archaeological manifestations of the prehistoric and protohistoric Wichita occupations in central Kansas are identified with the Great Bend aspect (*Ibid.*; Wedel 1959, 1961). In the western portion of the state, a number of sites have been identified with the Dismal River Apache (Wedel 1959).

The Lower Loup focus in Nebraska bears a degree of similarity to the Great Bend aspect (*Ibid.*), and may represent ancestral Pawnee. By the late 18th century, the Pawnee were situated in north-central Kansas, as exemplified by the Kansas Monument site, 14RP1 (*Ibid.*).

In northeastern Kansas, the Doniphan site, 14DP2, on the Missouri River is suspected to represent the "Grand Village" of the Kansa Indians visited by Bourgmond in 1724 (*Ibid.*). In the early 19th century, at least a portion of the Kansa tribe was located along the Kansas River in Pottawatomie County at the Manhattan site, 14PO24 (*Ibid.*).

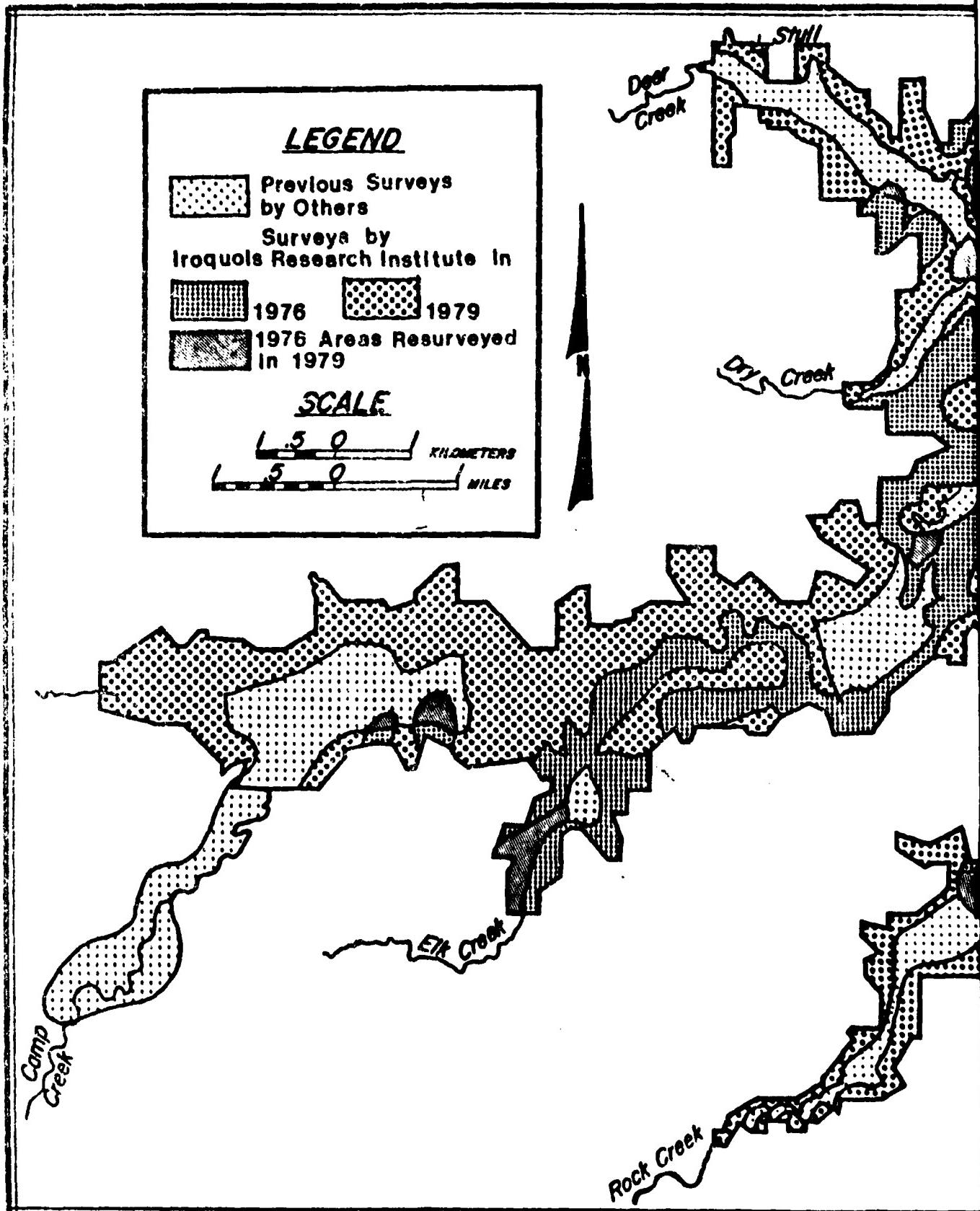
During the middle and late 18th centuries, the Osage expanded into southeastern and eastern Kansas, at least partially in response to the movement of the Wichita into Oklahoma and Texas (Hartley and Miller 1977).

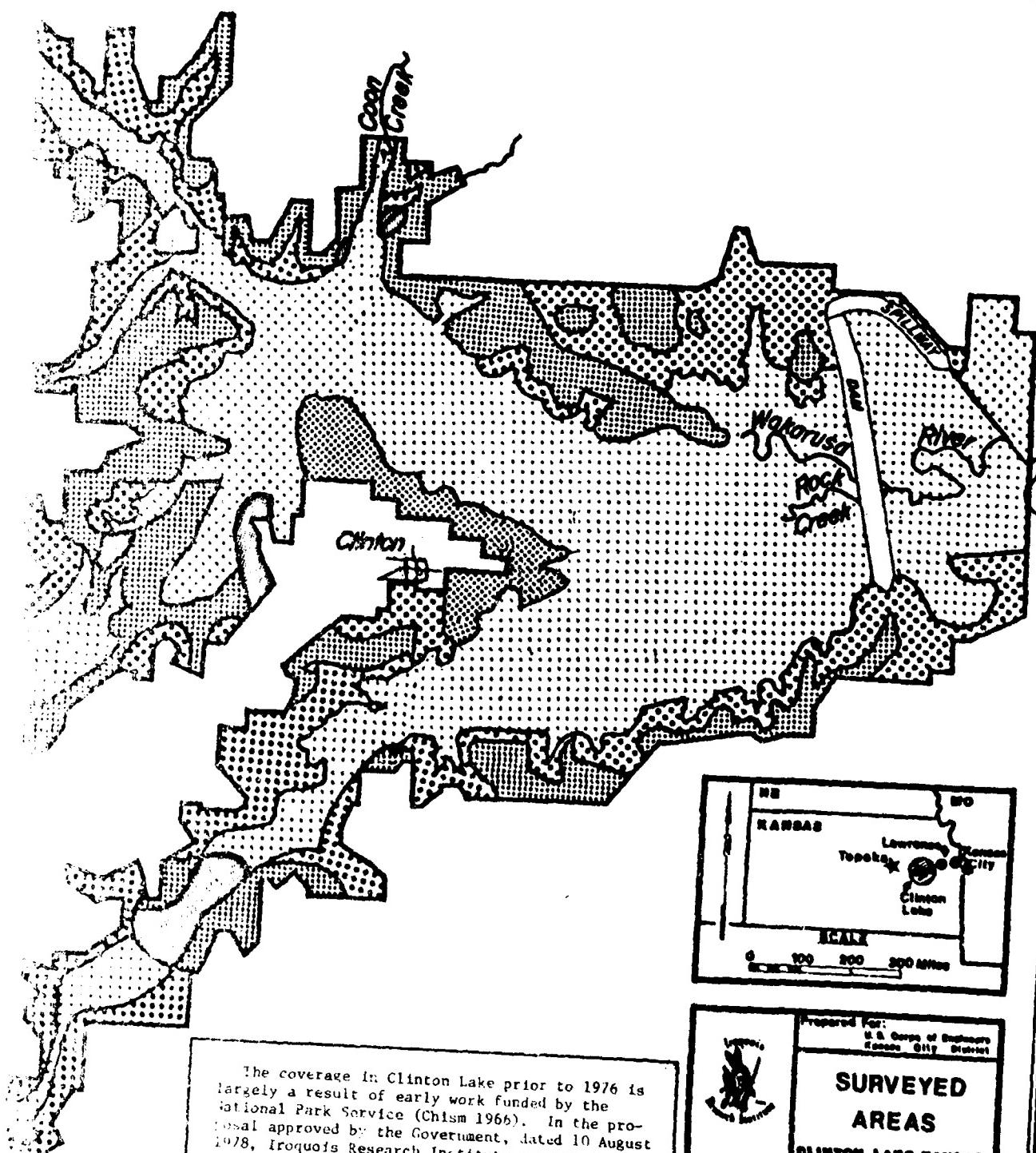
By 1846, the Kansa Indians were settled by the United States in a reservation along the Neosho River in Morris County, and they concomitantly ceded all of their eastern holdings, including much of northeastern Kansas (Swanton 1952). Similarly, the Osage were pressured to yield all title to northeastern Kansas in treaties of 1825, 1865 and 1870 (*Ibid.*).

During the period 1825-1831, Shawnees residing in Missouri and Ohio were relocated into portions of the eastern Kansas territories vacated by the Kansa. The most extensive settlement occurred along the south side of the Kansas River (*Ibid.*). In 1854, the Shawnee were compelled to retrocede their eastern Kansas holdings to the United States Government, and the tribe subsequently resettled in Oklahoma. The Delaware Indians, who had also been granted title to a small strip of land in northeastern Kansas, likewise ceded this territory back to the United States (*Ibid.*), allowing the Government to open up much of the area, including the Clinton Reservoir area, to Euro-American settlement.

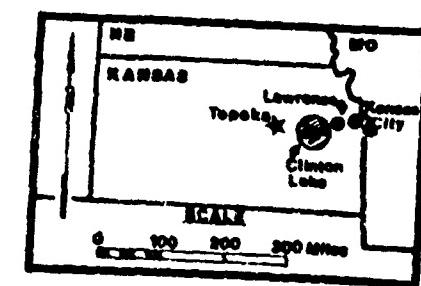
Previous Investigations

Plate 4 shows the location of the surveyed portions of the project area according to when they were surveyed. The first archaeological study of the Wakarusa Valley occurred in 1965 when James V. Chism of the University of Kansas Museum of Natural History appraised the archaeological resources of the proposed Clinton Reservoir. The report on this work (Chism 1966) discusses the artifacts found at 70 located sites but does not describe the survey methods used.





The coverage in Clinton Lake prior to 1976 is largely a result of early work funded by the National Park Service (Chism 1966). In the proposal approved by the Government, dated 10 August 1978, Iroquois Research Institute assumed that work adequately covered the Wakarusa River floodplain. As a result, Plate 4 indicates that the Clinton Reservoir has been completely surveyed. This differs from information presented on a similar map prepared for the 1977 Iroquois Research Institute survey report.



		Prepared For:	
		U.S. Corps of Engineers Kansas City District	
SURVEYED AREAS CLINTON LAKE, KANSAS			
Drawn By:	Contract No:	Date:	
(Signature)	DA-GW-780-0000	AUGUST 6, 1978	
Approved By:	Title:		4
(Signature)			

2.

Five of the sites reported by Chism are in areas outside the project area boundaries of this study. The artifacts collected by Chism represent 11 Archaic, 24 Woodland, 9 Central Plains, 9 general ceramic, 29 general prehistoric and 8 historic components. The Woodland components include one possible Hopewell-related site. Almost all of the prehistoric sites were found on low terraces, and a majority of these sites are situated along the two major tributaries of the Wakarusa River, Rock Creek and Deer Creek. Seven of the sites are close to the confluences of two streams. As a result of his work, Chism recommended that additional investigations be carried out at 24 of the discovered sites.

Alfred E. Johnson (1968) of the Museum of Anthropology, University of Kansas, Lawrence, supervised the excavation in 1966 of 11 of the 24 sites recommended by Chism. All sites were subjected to test pit excavations to determine if cultural deposits could be located below the plowzone in undisturbed contexts. Only sites 14D027, 14D032 and 14D019 were found to contain sub-plowzone deposits. These sites were subsequently subjected to intensive excavations.

Site 14D027, the Kampschroeder site, contained the remains of a burned circular house 7.25 meters in diameter, a storage pit, and a hearth containing burned fresh-water mussel shells. A great variety of chipped stone and ground stone tools and cord marked and plain pottery were also found.

Site 14D032, the Anderson site, also contained the remains of a structure as well as six storage pits and the remains of apparently secondary burials of an adolescent and an infant. The post mold pattern of the house indicated that it had been a circular structure, and fragments of daub recovered in excavations suggested a grass and daub cover. Lithic and ceramic remains were abundant at the site.

Site 14D019, the Hatcher site, was made up of three spatially separated concentrations of debris. Seven post holes found in one of the concentrations suggest that a rectangular structure with an internal hearth may have stood on the site sometime during prehistory. Sandstone grinding slabs, celts and a limestone pipe bowl fragment were found, as well as a wide variety of other lithic and ceramic artifacts.

Only two other prehistoric sites proved of great interest during Johnson's work. Observation of the banks of a stream bordering site 14D035 disclosed the presence of two distinct, separated occupation levels, one at 75 centimeters below ground surface and the other at a depth of two meters. However, extensive excavations failed to produce culturally diagnostic artifacts in either of the two stratigraphic levels.

The other site of interest was 14D041. Although Chism (1966:20) stated that the site had been occupied during the Archaic Period, Johnson's investigations suggested that a Central Plains occupation was present.

As a result of his investigations in the Clinton Lake project area, Johnson (1968) proposed that three cultural phases could be defined during the

post-Archaic occupation of the Wakarusa Valley: the Wakarusa phase, the Deer Creek phase and the Clinton phase. These three phases are described above in the section on culture history and are summarized in Table 2.

In 1976 the Iroquois Research Institute, under contract with the U.S. Army Corps of Engineers, Kansas City District, conducted an archaeological survey of a large portion of previously unsurveyed and inadequately surveyed areas of the Clinton Lake project area. Thirty-eight archaeological sites were investigated during this work, including 28 which were newly discovered. The scope of work included the examination of all previously reported sites in the project area, the compilation of an inventory of sites, the evaluation of sites for purposes of preservation or mitigation, and recommendations for sites which appeared to qualify for nomination to the National Register of Historic Places. The report (Iroquois Research Institute 1977) on this work includes a history of the project area and discussions of the historical, architectural and archaeological resources.

Although few of the newly discovered sites could be assigned to a specific prehistoric cultural period, the research extended the known occupation of the area into the Paleo-Indian Period, circa 11,000 B.C., by the discovery of a fluted point base of generalized Clovis type at site 14DO137. Iroquois recommended that 18 prehistoric sites be subjected to test excavations in order to determine their cultural affiliations and to evaluate their eligibility for inclusion in the National Register of Historic Places.

DISPOSITION OF BACKGROUND DATA

In addition to this narrative report, cultural resource data gathered during Iroquois Research Institute's testing and survey of the project area have been submitted to the U.S. Army Corps of Engineers, Kansas City District. The submitted data include detailed locational site maps by real estate tracts, USGS topographic maps showing the exact locations of the sites tested in 1978 and all newly recorded sites, U.S. Army Corps of Engineers baseline maps at a scale of 1:7,200 showing all of the known archaeological sites in the project area as well as the locations of the test pits excavated by the Institute, completed copies of the test excavation records, completed copies of the site survey records, completed copies of the Kansas State Historical Society Archaeological Survey forms, completed copies of the artifact inventory forms for both the tested and surveyed sites, and copies of all the photographs taken during the 1978 and 1979 field seasons. Artifacts recovered during the field operations are curated at the University of Kansas.

METHODOLOGY

Research Orientation

The Clinton testing and survey project is designed to fulfill the cultural resource management (CRM) and scientific requirements stated in the contractual scope of work. This scope called for the archaeological testing of 18 prehistoric sites recommended for testing in the 1977 Clinton survey report (Iroquois Research Institute 1977) in order to assess the sites' potential significance with respect to the criteria for nomination to the National Register of Historic Places. The scope of work was subsequently modified to allow for both the testing of an additional site, 14DO154, which was originally recorded as part of 14DO3, and the intensive survey of areas of the reservoir above elevation 857 m.s.l. that had not been covered by previous surveys. Limited subsurface testing sufficient to determine the size of each newly discovered site and to determine potential National Register eligibility was to be carried out under the scope modifications.

A basic orientation for research in the Clinton Reservoir was stated in Iroquois Research Institute's 1977 report, and is reiterated in the current scope of work:

The...sites...provide an important resource base for the study of behavior patterns relating to seasonality and scheduling of subsistence activities, patterns of settlement and movement within the drainage system, population demographics, and lithic technology. The upland sites also offer the opportunity for examining the systematic interrelationships of resource availability selection, and exploitation in this biophysical zone (Ibid.:170).

Settlement pattern analysis is an appropriate research topic for survey level archaeological investigations. By examining the distribution of sites in different environments, their presumed functions and their periods of occupation, information may be obtained on changing human-environmental relationships. Settlement pattern studies may become more refined as greater amounts of archaeological data are available from individual sites. A thorough settlement pattern analysis must incorporate information regarding the chronological period of occupation and the range of activities that were carried out at each site. Testing was undertaken to furnish further data concerning the sequence of cultural occupation in the Clinton Lake area, and to more accurately assess the function of the sites reported in 1977 (Ibid.).

The extent of the testing, survey and analysis that could be undertaken in this project was severely limited by budgetary restraints. In view of these restraints, the scope of work specifically called for only the "preliminary analysis" of cultural materials recovered, with an emphasis placed upon the curation and documentation of all data in order to facilitate future problem-oriented research.

Site Testing Methods

The survey procedures employed in the 1976 Iroquois Research Institute survey of the Clinton Reservoir, coupled with the recommendations made in the subsequent report (Iroquois Research Institute 1977), formed the basis for the 1978-1979 site testing program. During the planning stage for the 1978-1979 project, however, the original recommendations for testing were reviewed and a number of modifications were made in light of several factors. Factors apparent in the field also resulted in modifications to the original recommendations.

Among the factors that were involved in the determination of testing effort at each site were: the area of each site as estimated in 1976, and an attempt to make the testing effort more proportional to site area; the surface artifact density in transects surveyed at each site in 1976; the nature of the project impact upon each site; the ranking of each site in the 1977 report; and the field conditions observed at each site in 1979. It should be noted that these factors are not complementary and that they could not all be applied equally to each site tested.

For example, the strictly proportional allocation of test pits to each site on the basis of areal extent alone would have meant that one site, 14D0128, would receive over 23% of the testing effort even though it had a relatively low ranking with regard to other factors. Consequently, the actual allocation of test effort to 14D0128 was scaled down in order to free effort for sites highly ranked with regard to other factors such as surface artifact density and project impact. Similar problems would also have attended the automatic application of the other factors to most of the sites tested in 1978-1979. In most cases, therefore, a judgmental combination of factors determined the number of test pits allocated to each site, and in all cases but three, these factors resulted in an alteration of the original 1977 recommendations.

A 1 x 1 meter test pit was chosen as the basic test unit. A standardized excavation unit size was chosen in order to facilitate the comparison of excavated artifact densities both between sites and within each site. During the testing of each site, two methods were employed to determine the location of test pits. Roughly 65% of all test pits excavated were randomly placed along the survey transects established during the 1976 survey project. Generally the 1 x 100 meter transects which yielded the greatest apparent density of surface material in 1976 were tested, and a single 1 x 1 meter test unit was randomly placed along each of these tested transects. Among the sites that were tested partially in this fashion, the percentage of randomly excavated test pits ranged from 43% at 14D0137 to 83% at 14D0132. One site, 14D03, had no randomly placed pits due to the fact that it was located primarily outside of the 1976 transects.

The remainder of the test units dug at each site were non-randomly placed outside of the 1976 transects. These pits were placed in areas that appeared to have the potential to yield high densities of subsurface remains or cultural features. In addition, these pits were placed in order to verify a continuous

scatter of material between transects, increase the areal sampling of each site, and test areas visibly different from the tested transects. Pits were also non-randomly placed in order to assist in the verification of original site size estimates, where surface indications were suspected to be inadequate.

With the exception of the plowzone, which was usually removed in one unit, the excavation of each test pit was done in arbitrary 10 centimeter levels. In a number of situations, however, the plowzone was also excavated in 10 centimeter levels to serve as a control. With a few exceptions brought about by the possible recognition of subsurface features, all sub-plowzone levels were horizontal 10 centimeter levels, as measured from the northeast corner. Soil samples were retained from all excavated levels including the plowzone horizons and subjected to water screening in the laboratory to recover floral and microlithic debris. In all but a few cases, however, such tests gave negative results. The results of positive tests are discussed in the appropriate site descriptions.

All cultural material recovered from the test excavations was bagged by test pit and level. Excavation data were recorded for each level on a test excavation form and in each crewperson's personal notebook. At least one wall of each pit was scraped with a trowel and a generalized soil profile was drawn.

Test pits were excavated with a combination of tools. During the initial phases of testing, excavation was done with shovels and trowels and earth was screened through a one-quarter inch mesh. The extremely heavy and compact clays underlying the plowzone in many sites, however, made digging and screening extremely difficult and time-consuming, necessitating the introduction of alternate means of data recovery. Toward the end of the field season, the above tools were supplemented by the action hoe, which consists of a short, serrated cutting blade mounted upon a hoe handle in such a way that the blade can swivel to compensate for any changes in the angle of the handle. The use of this tool allowed the clay to be excavated in thin slices that could be quickly examined in the screen, by manual means in the pits, or both. An action hoe is illustrated in Plate 5.

It was agreed by the Corps of Engineers and Iroquois Research Institute that the testing operations were to be carried out within a measurable parameter. Consequently, the total amount of effort allocatable to testing was expressed as a volumetric measure of excavated earth. In order to stay within this limit, a compromise between the allocated number of test pits and the depth of digging was sometimes made, resulting in a situation where certain test pits had to be closed before sterile soil had been reached.

In addition to the test excavations, at several sites small, selective "grab sample" surface collections were made. The artifacts collected were usually diagnostic or potentially diagnostic. Since controlled surface collections were not undertaken at the tested sites, the surface area of each site has been calculated solely as the product of the site dimensions given in 1976 (Ibid.), or modifications of those resulting from the testing program in 1978-1979.



PLATE 5

The tool shown above is commercially called an action hoe. Iroquois excavators found this instrument particularly helpful in the leveling of test pit floors with no difficulty to possible in situ remains. The action hoe was often used where spatial limitations or the presence of fragile artifacts precluded the use of a shovel.

Survey Methodology

The survey design established for the 1978-1979 Clinton Lake project is partially a result of a compromise between a need to adequately survey unsurveyed portions of the reservoir and limitations in the amount of effort that could be undertaken under the present contract. In view of the overriding CRM concerns, it was felt that the study area should be prioritized in order to ensure that the greatest areal coverage was afforded to those areas that were likely to be subjected to the most severe or permanent impacts and that were likely to exhibit the highest density of prehistoric sites. Accordingly, the entire reservoir was divided into four ecological zones: Floodplain, Second Terrace, Wooded Slope and Upland Prairie. Plate 2 illustrates the distribution of these four zones.

Based upon the anticipated impacts of the reservoir and the suspected rates of site occurrence in each zone, the following survey priority was established for the ecological zones in the 1979 survey area. The zones are listed in decreasing order of importance:

1. Second Terrace -	1,702 acres
2. Floodplain -	1,448 acres
3. Upland Prairie -	1,014 acres
4. Wooded Slope -	2,427 acres

The least severe impacts should occur in the Wooded Slope and Upland Prairie zones, while areas in the Second Terrace and Floodplain zones are expected to be heavily impacted by inundation, wave action or both. Based upon data summarized from previous surveys (Iroquois Research Institute 1977), the Second Terrace zone apparently contains the highest density of sites. Somewhat surprisingly, the floodplains of the Wakarusa Valley are almost devoid of sites, probably due to fluvial deposition and erosion, but the area will be heavily affected by the Clinton Lake.

The 1979 survey was organized into two sequential phases of field work: a site discovery phase and a site verification phase. The site discovery phase was principally a walkover transect survey. During this initial phase, the field crews walked parallel transect alignments across the landscape, searching for prehistoric and historic remains. Prior to the field work, each area that was to be surveyed was classified as belonging to one of the four ecological zones.

Data on the sizes of sites recorded in the 1976 survey were compiled and analyzed to select an appropriate interval between crew members for the walkover survey. The site size distribution for 29 prehistoric sites recorded in the 1976 survey (Ibid.) is presented in Table 3.

For the purpose of estimating the statistical reliability of a walkover survey, each walkover may be defined as a one meter wide transect sample. The one meter value is chosen because it approximates the minimum area that an archaeologist can survey while maintaining a constant bearing under diverse field conditions. The sampling fraction for spatial coverage is based on the width of the transects and on the intervals between transects. At 50 meter intervals between field crewpersons, each transect makes up 1/50 of the surface area, which is equivalent to a sampling fraction of two percent.

Assuming circular site shape and equal visibility throughout the area, the probability that sites of a given size will be intersected during a walkover survey is given by the following simple equation:

$$\text{Probability of Intersection} = \frac{\text{Diameter of Site}}{\frac{\text{Interval between Transects}}{\text{minus Width of Transects}}}$$

This equation yields the minimum probability that any surface site will be intersected by a transect, since the probability of intersection is increased for a less compact, non-circular site as an integrative function of the site's longest diameter, assuming random orientation.

TABLE 3
PREHISTORIC SITE SIZE DISTRIBUTION
CLINTON LAKE, KANSAS*

SITE DIAMETER	NUMBER OF SITES	PERCENT OF TOTAL SITES
1-29 m	0	0
30-49 m	5	17.2
50-69 m	4	13.8
70-89.9 m	6	20.7
90-109.9 m	3	10.3
110-129.9 m	3	10.3
130 + m	8	27.6
TOTALS	29	100 %
Mean site diameter: 113 m	Range: 33.9 m (14D0143)	
Standard deviation: 70 m	298.6 m (14D0128)	
*Source: Iroquois Research Institute (1977).		

Based upon data obtained during the 1976 Iroquois Research Institute survey in the Clinton Reservoir (Ibid.), the average site diameter is 113 meters with a standard deviation of 70 meters. This assumes the most compact site dimensions. Transects 58 meters apart would intersect all circular sites over

57 meters in diameter. Assuming a standard normal distribution, this would comprise 78.8% of all potential sites. The remaining 21.2% of the sites should average more than 43.5 meters in diameter, again assuming a standard normal distribution. Hence, the minimum probability that any given one of these sites will be detected averages 76.3%:

$$\text{Probability of Intersection} = \frac{\text{Diameter of Site}}{\text{Interval between Transects minus Width of Transects}} = \frac{43.5}{58-1} = 76.3\%$$

On the average, 76.3% of the 21.2% of potential sites with diameters smaller than 57 meters will be intersected, or 16.2% of all potential sites. This percentage added to the percentage of sites with diameters larger than 57 meters indicates that at least 95.0% of all sites will be intersected by transects 58 meters apart, on the basis of previous data. This figure is conservative because it is based on the site shape least likely to be intersected by transects, because random orientations are assumed so that transects cannot be favorably oriented, and also because it appears that the distribution of site diameters is positively skewed, rather than normal.

It was impossible, however, to utilize 58 meter transect intervals in the entire 6,591 acre survey area within the parameters of the present contract. Consequently, in view of the priorities established among the four ecozones, the following transect intervals were agreed to by the Corps of Engineers:

<u>Ecological Zone</u>	<u>Transect Interval</u>
Second Terrace	58 meters
Floodplain	80 meters
Upland Prairie	100 meters
Wooded Slope	120 meters

It is recognized that the use of different transect intervals in the four ecozones introduces the question of comparability of survey results among the zones, especially with regard to settlement pattern analyses based upon the relative density of sites in each zone. Such a methodology was necessary, however, in order to ensure that adequate coverage was given to the Second Terrace zone, where previous surveys have indicated that most of the endangered cultural resources in the Clinton Reservoir are likely to be located, and where the impacts of the reservoir will be severe.

The survey was undertaken between 27 March and 15 May 1979. The basic survey unit was a 1 x 100 meter transect segment that was intensively surveyed by a single crew member. In situations where the ground surface within a transect segment was heavily obscured by vegetation, shovel or rake tests were employed to improve visibility. Shovel tests were 30 x 30 x 30 centimeters in size, and excavated soil was examined for the presence of cultural material or features. Rake tests consisted of clearing the vegetation from a 1 x 1 meter area and were always used on steep wooded slopes. Shovel or rake tests were conducted at 30 meter intervals along each transect segment with poor visibility and were assigned transect designations. The results of these tests were entered on standard transect control sheets.

In addition to the intensive survey of one meter transects, surveyors also made note of surrounding areas visible from each transect. Chert outcrops or other "suspicious" areas were visited by the survey team. No additional archaeological sites were identified in these areas.

Upon the discovery of prehistoric artifacts within a transect, a preliminary assessment was made of the site area in order to determine if a return visit was necessary. In cases where the observed material was limited to a single artifact in a single isolated transect segment, the find was considered an "isolated find" and site verification procedures were not carried out. Two isolated finds of prehistoric artifacts were reported during the survey, and they were assigned temporary designations. Although both finds are noted on the USGS quadrangle maps submitted as background data, they have no official trinomial designations, and they are not included in the discussion of sites discovered by the 1979 survey. Each occurrence of multiple prehistoric artifacts within a single transect or several transects was reported as a site and a datum stake was placed in the vicinity in order to facilitate return during the site verification phase. Modern historic sites discovered during the survey were generally not revisited for site verification procedures.

A cut-bank inspection of the Wakarusa River was integrated into the site discovery phase in order to locate deeply buried cultural material that may have been exposed by erosion and bank slumping. This inspection began at the western limits of the project area where an intermittent stream enters the Wakarusa River and proceeded downstream for approximately 10 miles. Stops were made at every location where a cut-bank was visible and at each such location a visual examination was conducted and a profile was troweled to expose the stratigraphy. The area inspected was plotted on the U.S. Army Corps of Engineers baseline maps and the results were entered on cut-bank inspection records. Forty-three of these inspections were made in the two-day survey. No sites were located by this method.

The site verification phase of the survey involved follow-up visits to the prehistoric sites for intensive data collection. During this phase, precise site locations were determined, site maps and vicinity maps were drawn, photographs of the sites were taken, controlled surface collections were conducted, and a variety of cultural and environmental data was recorded on standardized survey forms including the standard Kansas State Historical Site form.

The examination of each site entailed estimating its surficial extent and placing a grid origin in the area of highest apparent artifact concentration. Once this was accomplished, a grid system was established by extending north, south, east and west vectors from the grid origin. Those sites with small amounts of surficial material, generally less than five artifacts per 100 square meters, were intensively collected by quadrants. Sites with relatively high amounts of surficial material were sectioned off into 20 x 20 meter grid units. Artifacts were systematically, intensively collected from the northeast 10 x 10 meter quarter of each grid unit, while only diagnostic artifacts such as pottery, tools or projectile points were selectively collected from the remaining sections of the 20 x 20 meter units.

TABLE 4

ARTIFACT CLASSIFICATION FOR HISTORIC ASSEMBLAGES*

CLASS	CLASS DEFINITION	SUBCLASSES
1	Artifacts related to collection, processing and storage of subsistence foods	1a. Collection of subsistence foods subclass 1b. Processing of subsistence foods subclass 1c. Storage of subsistence foods subclass
2	Artifacts related to preparation and consumption of subsistence foods	2a. Tableware 2b. Kitchenware 2c. Ceramics 2d. Drinking containers 2e. Fireplace items 2f. Other
3	Faunal and floral remains of subsistence foods	3a. Animal bone 3b. Other
4	Tools and machinery used for solely technological activities	4a. Construction tools 4b. Miscellaneous hardware 4c. Other
5	Artifacts associated with the housing of persons and goods	5a. Architecture group 5b. Furniture group
6	Artifacts of a general nature associated with the presence of persons	6a. Clothing group 6b. Personal group 6c. Military objects 6d. Recreation group

* Adapted from Lewis (1977) and South (1977)

Artifacts from each unit were counted and bagged, their provenience was noted, and the results were tabulated on surface collection records. When controlled surface collections were made, it was feasible to accurately estimate total site surface area independently of the site's maximum north-south and east-west dimensions.

Limited testing consisting of shovel tests and rake tests was performed to determine site limits and assess National Register significance. These tests were conducted on each cardinal vector at five or 10 meter intervals depending on specific conditions at each site. As in the site discovery phase, shovel tests were 30 x 30 x 30 centimeters in size. Rake tests were used at sites with a vegetative ground cover and consisted of clearing a 1 x 1 meter area.

The examination of historic archaeological sites was generally accomplished during the walkover survey and included completion of a standardized inventory of the artifact content at each site. The presence or absence of general artifact classes and subclasses was recorded in the field, and only those artifacts with diagnostic potential were collected. The historic artifact classification system outlined by Kenneth Lewis (1977) has been borrowed for use in this project with limited modifications and derivations incorporated from the system developed by Stanley South (1977). Also, some new subclasses were added to handle the large quantity of 20th century archaeological resources expected in the study area. In the resulting system presented in Table 4, artifact assemblages are categorized into six general artifact classes which have been designed to define functional or activity related components on an empirical basis.

A site map was drawn for each historic site, photographs were taken if possible, and a variety of cultural and environmental data was recorded on the standardized site survey form illustrated in Plate 6. Since controlled surface collections were not made at historic sites, it was generally impossible to determine total site area except as a product of the maximum north-south and east-west dimensions.

Laboratory Methods

Much of the laboratory work for the Clinton Lake survey and testing project involved the classification and analysis of chipped stone tools anddebitage.

Prehistoric artifacts were classified according to raw material and morphological or technological attributes relating to particular methods of manufacture and presumed use. All observations were made with the unaided eye or with a low-powered binocular microscope. Due to limitations on the scope of analysis allowed for this project, no detailed edge-wear or replicative experiments were undertaken to assist in the classification or analysis of artifacts.

PLATE 6

CR 1 REV. 4/78.1

PAGE 1

FIELD CONTR.
NO.FINAL REF.
NO.

CULTURAL RESOURCE TYPE _____

NAME OF RESOURCE _____

STATE/PROVINCE/TERRITORY _____

COUNTY _____ USGS OR CSC QUAD _____

UTM: ZONE _____ EAST _____ NORTH _____

TOWNSHIP _____ RANGE _____ SECTION _____; _____ 1/4 of _____ 1/4

SITE LOCATION AND DESCRIPTION

_____FEATURES _____

SITE DIMENSIONS (in meters) _____

CULTURAL AFFILIATION _____

ENVIRONMENTAL CHARACTERISTICS

Topographic Zone _____ Elevation _____

On-Site & Surrounding Vegetation _____

Exposure _____ Soil Texture _____

Soil Drainage _____ Soil Depth _____

Distance to Nearest Water Source(s) _____

Type of Water Source(s) _____ Slope _____

SITE INTEGRITY

Erosion, Disturbance, Modification _____

Anticipated Adverse Impacts _____

Comments _____

Iroquois Research Institute
 3251 Old Lee Highway Suite 414
 FAIRFAX, VIRGINIA 22030
 (703) 273-3166

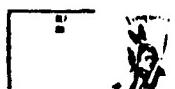
SITE SURVEY FORM

CR 1

Prehistoric artifacts were grouped into nine morphological categories, which were subsequently subdivided into more specific classes on the basis of form, suspected function, or technological attributes. A numeric code was assigned to each class in order to simplify recording items on artifact

PLATE 5 (continued)

CR 1 REV. 4/78



PAGE 2

OWNERSHIP (name, address, telephone)

PRIOR DOCUMENTATION AND STUDY

FIELD METHODOLOGY

LAB SAMPLES COLLECTED

ARTIFACTS COLLECTED OR OBSERVED

Prehistoric: Lithic Ceramic Other

Historic: Ceramic _____ Other _____

GRAPHICS DRAWN

PHOTOGRAPHS (roll and exposure #'s) _____

ADDITIONAL COMMENTS AND OBSERVATIONS _____

PARTY CHIEF **RECORDER**

RECORDED

DATE

Iroquois Research Institute
3251 Old Lee Highway Suite 414
FAIRFAX, VIRGINIA 22030
(703) 273-3166

SITE SURVEY FORM

CR 1

inventory sheets. Not all of the numeric codes assigned during the course of the Clinton project were actually utilized in the classification and analysis of material recovered, resulting in the numerical gaps apparent in the final code sheet. The artifact classes and codes are shown in Table 5

PLATE 6 (continued)

CR 1 PAGE 3		FIELD CONTR. NO.	FINAL REF. NO.
LOCAL SITE FIELD SKETCH SHOW BEARING AND SCALE			
A large grid area for sketching a local site field sketch, showing bearing and scale.			
Iroquois Research Institute 3251 Old Lee Highway Suite 414 FAIRFAX, VIRGINIA 22030 (703) 273-3166		SITE SURVEY FORM CR 1	

The widest variety of prehistoric items were classed as bifaces. For an artifact to be identified as a biface, it had to be relatively extensively flaked on both faces and have an edge at least partially defined by the intersection of the flaked faces. Most identifiable bifaces were projectile

TABLE 5
ARTIFACT CODE SHEET

<u>Bifaces</u>		<u>Cores</u>
001	projectile point--complete	070 polyhedral blade core
002	projectile point base	073 disc core
003	projectile point tip	074 quarry waste
004	projectile point mid-section	075 exhausted core
006	modified point--scraper	076 core fragment
008	modified point--perforator/drill	077 other core
009	point preform	
010	other preform	
016	end scraper	
017	side scraper	
018	scraper--both	
021	perforator/drill	
023	chopper	
026	biface other--larger than 15mm	
027	biface other--smaller than 15mm	
028	biface fragment	
		<u>Debitage</u>
080	primary decortication flake	
081	secondary decortication flake	
082	interior flake	
086	other debitage	
		<u>Ground Stone Tools</u>
043	spokeshave	099 axe--full-grooved
044	notched flake	102 celt
046	end scraper--unhafted	
047	side scraper--unhafted	
049	scraper--both	
050	chopper	
051	utilized flake	
052	flake tool	
053	retouched flake	
		<u>Cobble Tool</u>
121	hammerstone	
		<u>Ceramics</u>
150	rim sherd	
151	body sherd	
		<u>Miscellaneous</u>
200	fire cracked rock	
201	pigment	

points, projectile point fragments and modified projectile points. In order to be classed as a projectile point, a biface had to exhibit well delineated blade and hafting elements, or to be a fragment of an artifact apparently exhibiting such elements. No definite functional attributes are assumed by the term projectile point, and it is recognized that many large points may actually have served as knives or scrapers (Ahler 1971). In addition to complete points, which were coded as 001, fragments of point bases or proximal ends, tips or distal ends, and mid-sections were coded as 002, 003 and 004, respectively. Code number 006 was assigned to projectile points that exhibit an edge that has been deliberately modified into a steep scraping plane, and 008 refers to those exhibiting a tip modified into a relatively narrow projection, possibly useful as a perforator or drill.

Two classes of bifacial items were identified as preforms. Items classed as preforms exhibit relatively complete flaking on both faces, but generally lack the detailed retouch that results in a finished artifact form. Some preforms appear morphologically similar enough to finished projectile points to be classed as point preforms, while others are more generalized or less completely finished. These items were coded as 009 and 010, respectively.

Other bifaces exhibit extensive scraping edges produced by the presence of steep, high angle flaking along one or several edges. Bifacial scrapers are classed as end or side scrapers depending upon whether the most extensive scraping edge is apparent on a distal end or along a lateral edge. In addition, some bifacial scrapers possess extensive high angle scraping edges on both a lateral edge and a distal end. Bifacial end scrapers were assigned code 016, side scrapers, 017, and scrapers exhibiting both distal and lateral working edges were coded as 018.

Other specifically identified bifacial artifact classes include drills or perforators and choppers. Drills or perforators are characteristically narrow bifaces presumed to be utilized for perforation and drilling softer materials such as hide and bone. These items were given code number 021. A chopper is characteristically a large, heavy, incompletely flaked biface exhibiting a crudely finished working edge that may have been used for heavy chopping and cutting tasks. Bifacial choppers were coded 023.

Three additional categories were used for bifaces that are either too fragmentary or too generalized to allow classification within any of the other groups. Generalized bifaces were coded 026 or 027, depending on their size. The large biface grouping, 026, may likely include items functionally classifiable as knives. Code 028 was assigned to fragmented, generalized bifaces.

Another major category of artifacts includes items manufactured from flakes that exhibit primarily unifacial flaking. A wide range of morphological and presumed functional classes is included in this category. Artifacts exhibiting extensive, high angle, unifacial flaking are termed scrapers. A flake scraper was given code number 046 if it exhibits the most extensive working edge on the distal end of the flake. A scraper coded 047 displays the principal working edge along one or both lateral margins. Other scrapers are extensively worked on both the distal and lateral edges and were assigned code

number 049. Another class of flake tools, spokeshaves, is defined by the presence of a strongly concave unifacially flaked scraping edge. Notched flakes are similar, but the working edge is usually confined to a much smaller notch or notches. These classes were assigned code numbers 043 and 044, respectively.

Certain large flakes exhibit crude unifacial flaking, resulting in a rough working edge. These items were classed as choppers, code number 050. Utilized flakes, code number 051, are essentially unmodified flakes that show edge damage from presumed use, but little or no intentional retouching. Retouched flakes, 053, are flakes that show evidence of some deliberate retouching for various tool functions, but are not extensively modified. Flake tools, 052, on the other hand, exhibit extensive, low or intermediate angle retouching along the margins.

Artifacts manufactured on blades comprise another major category of material recovered in the Clinton project. Blades are distinguished from flakes by possessing a length to width ratio of greater than two to one and increased evidence of manufacture from some form of prepared core. Unmodified blades show no evidence of use-wear or retouching, but are not classed asdebitage on the presumption that they were deliberately manufactured for tool use. These items were given the code number 060. In fact, it is not unlikely that detailed microscopic edge-wear studies would reveal evidence of tool use on many blades classified as unmodified based upon the limited analysis possible in this project. Other blades were modified into end scrapers, 061, or side scrapers, 062, or exhibit scraping edges on both the lateral edge and distal end, 065. Number 064 was assigned to knives, utilized blades exhibiting an acute working edge. Blades with a maximum length of 2.5 centimeters or less were classed as microblades and assigned code number 066.

Six classes of artifacts are grouped as cores. The class "polyhedral blade core" is employed to describe cores that show evidence of having had blades systematically removed in the same direction around the circumference of the core. These items were assigned code number 070. Disc cores, 073, tend to be circular in outline and to have had flakes or blades removed from two faces. The term quarry waste is used to describe large blocky fragments produced in the early stages of lithic collection and reduction. Strictly speaking, these items are not cores. A core was classed as exhausted, 075, if it shows extensive flaking and if it seems to have been reduced to such a small size that further flake removals would have been difficult. The class "core fragment" is used to describe apparently fragmentary portions of cores, and a residual category is defined for any items suspected to be cores that could not be placed into any of the more specific classes. These items were given code numbers 076 and 077, respectively.

Flakes and other by-products of chipped stone artifact manufacture are classed asdebitage. To be classed as a flake, a piece ofdebitage must minimally display a striking platform and bulb ofpercussion indicative of deliberate removal from another piece ofstone. A primary decortication flake, 080, exhibits a dorsal surface completely composed of the original cortex of the parent piece. The dorsal face of a secondary decortication flake, 081, is

only partially composed of the original cortex, with the remainder consisting of flake scars indicative of earlier flake removals. An interior flake, 082, lacks any indication of cortex on the dorsal surface and is presumed to have generally been removed later in the course of artifact manufacture than decortication flakes. If an item is not definitely identifiable as a flake, it is classed into a residual group. This class "other debitage" includes items suspected to be flakes, but which lack bulbs of percussion or striking platforms. It also includes small, angular, shattered pieces of chert which could be classed as neither flakes nor quarry waste. Code number 086 was assigned to this group.

Few ground stone artifacts were recovered from the testing and survey. They include a full-grooved axe, 099, and an artifact classed as a celt, 102. Cobbles modified by pecking and battering were classed as hammerstones, code number 121.

The artifact codes employed for the formal sorting of ceramics identify two classes. A sherd was classed as a rim sherd, 150, if it contains part of the rim portion of a pottery vessel. Sherds that do not incorporate any portion of the rim were classed as body sherds, 151. Stone which displays discoloration suspected to be the result of exposure to fire and which is heavily fractured was classed as fire cracked rock, 200, and the class "pigment" refers to iron oxides such as hematite. Pigments were given code number 201.

The majority of the lithic artifacts recovered during the Clinton Lake project are made of locally available chert. Two Pennsylvanian limestone formations that outcrop within the vicinity of the project area contain members that produce chert. Two chert-bearing members of the Oread Limestone Formation, Plattsouth and Toronto, outcrop directly within the project area (O'Conner 1960). Of the two, Plattsouth seems to be much more extensive. Plattsouth chert is described as a "blue-gray" fossiliferous chert (Ibid.). Chert from the Toronto Member is described as "yellow-brown." Johnson (1968), on the other hand, describes Clinton Lake cherts as ranging in color from "buff" through "rose colored." In addition to cherts outcropping directly within the project area, a chert-bearing member of the Deer Creek Formation outcrops outside of the reservoir area in southwestern Douglas County (O'Conner 1960). This material is a "dull gray" fossiliferous chert (Carlson and Peacock 1977a).

Blue-gray, gray and tan fossiliferous cherts are common throughout eastern Kansas. The Winterset Limestone produces gray chert in Wyandotte and Johnson Counties (Reid 1976) and tan to "buff" Westerville cherts occur in the same area (Newell 1931). The Dewy limestone deposits in northern Johnson County produce chert exhibiting a wide range in color (Ibid.), and other blue-gray materials occur along the Missouri River (Reid 1976). Gray and dark gray fossiliferous cherts are common throughout the Flint Hills in eastern Kansas, and are widely used in eastern Kansas and into Nebraska (Carlson and Peacock 1977b). Similar materials occur in the Florence and Foraker Limestones in northern Oklahoma (Banks 1974).

TABLE 6

RAW MATERIAL CODE SHEET FOR PREHISTORIC ARTIFACTS

CODE	MATERIAL	CODE	MATERIAL
01	Beige chert	12	Tan chert
02	Black chert	13	White chert
03	Blue-gray and pale green chert	14	Yellow chert
04	Brown chert	15	Banded chert
05	Burnt orange chert	16	Hematite
06	Cream chert	17	Granite
07	Gray chert	18	Greenstone
08	Pink chert	19	Sandstone
09	Purple chert	20	Quartzite
10	Red chert	21	Grit tempered pottery
11	Rust chert	22	Sand tempered pottery

The lithological characteristics of cherts occurring in the Clinton Reservoir vicinity are as yet too poorly known to permit the detailed sorting of lithic materials recovered from the 1978-1979 testing and survey program on the basis of presumed source areas. The lithic materials were sorted primarily by color and divided into the categories appearing in Table 6. Table 7 indicates the Munsell color notations represented by each descriptive color category.

TABLE 7
CHERT CLASSIFICATION BY COLOR

DESCRIPTIVE COLOR NAME		MUNSELL COLOR (1975) NOTATION AND COLOR NAME			
Beige	10YR 8/3*			5YR 7/2	
	10YR 8/4	Very Pale Brown		5YR 6/2	Pinkish Gray
	10YR 7/3*				
	10YR 7/4				
Black	2.5YR 3/0*			5Y	2.1/1*
	5YR 3/1			5Y	2.5/2
	7.5YR 3/0			2.5Y	2/0 Very Dark
	10YR 3/1	Black		10YR 2/1	Gray
	2.5Y 3/0			7.5YR 2/0	
Blue-Gray and Pale Green	5Y	3/1		5YR 2.5/1	
	5YR 7/1*	Light gray		7.5YR 7/0*	Light gray
Brown	7.5YR 4/2	Dark brown to brown		2.5YR 4/4	Reddish brown
	7.5YR 4/4	Dark brown to brown		10R 4/2	Weak red
	10YR 4/3	Dark brown to brown		10R 5/2	
	7.5YR 5/2	Brown		2.5YR 4/2	
	7.5YR 5/4			2.5YR 5/2	Weak red
	10YR 5/3*	Brown			
Burnt Orange	10R 4/6			2.5YR 4/6*	
	10R 4/8			2.5YR 4/8	
	10R 5/6*	Red		2.5YR 5/6	Red
	10R 5/8			2.5YR 5/8	
Cream	5YR 8/2	Pinkish White		10YR 8/2	White
	7.5YR 8/2*				

* = specific example

TABLE 7 (continued)
CHERT CLASSIFICATION BY COLOR

DESCRIPTIVE COLOR NAME	MUNSELL COLOR (1975) NOTATION AND COLOR NAME			
Gray	2.5YR 4/0	Dark gray	10YR 6/1*	Gray to light gray
	5YR 4/1	Dark gray	5Y 6/1*	Gray to light gray
	10YR 4/1	Dark gray	10YR 7/1	Light gray
	5Y 4/1	Dark gray	10YR 7/1	Light gray
	2.5YR 5/0*	Gray	5Y 5/1*	Light gray
	2.5YR 6/0	Gray	10YR 5/2	Grayish brown
	5YR 5/1	Gray		
	5YR 6/1	Gray		
	7.5YR 4/0	Gray		
	10YR 5/1	Gray		
Pink	2.5YR 5/4*		SYR 7/3*	
	5YR 4/3		SYR 7/4	
	5YR 4/4	Reddish brown	SYR 8/3	Pink
	5YR 5/3*		SYR 8/4	
	5YR 5/4		7.5YR 7/4	
Purple	10R 6/2*		7.5YR 8/4	
	10R 6/3*	Pale Red	10R 6/4	Pale Red
Red	10R 4/3		2.5YR 6/2*	
	10R 4/4	Weak Red	10R 5/3*	
Rust	2.5YR 6/4		10R 5/4	Weak Red
	5YR 6/3			
	5YR 6/4*	Light reddish brown		
Tan	10YR 6/3		7.5YR 6/2	Pinkish gray
	7.5YR 6/4*		7.5YR 7/2*	
	10YR 6/2*	Pale brown		
White	5YR 8/1			
	7.5YR 8/0*	Light brown		
	10YR 8/2*	Light brownish gray		

* = specific example

TABLE 7 (continued)

CHERT CLASSIFICATION BY COLOR

DESCRIPTIVE COLOR NAME	MUNSELL COLOR (1975) NOTATION AND COLOR NAME			
Yellow	10YR 3/4		10YR 5/4*	
	10YR 3/6	Dark yellowish	10YR 5/6	Yellowish brown
	10YR 4/4*	Brown	10YR 5/8	
	10YR 4/6		10YR 6/4*	Light yellowish brown
			2.5Y 6/4*	
Banded Chert	5Y 6/1	Gray to light gray and A	10YR 5/1	Gray
	10R 5/3	Weak red and A	5YR 4/3	Reddish brown

* = specific example

Although the color sorting of cherts is primarily a descriptive study aimed at developing a set of standardized measurements for the future analysis of Clinton Reservoir cherts, color divisions may be useful analytic tools in themselves. First-hand observation by the Iroquois Research Institute field party, as well as other studies (Ibid.; Hartley 1974), indicate that many of the gray fossiliferous cherts that occur in eastern Kansas and northern Oklahoma, including the Plattsmouth cherts in the project area, probably weather to a tan, "buff" or burnt orange color upon prolonged exposure to the elements. Many of the gray or "buff" fossiliferous cherts that occur throughout eastern Kansas and into northern Oklahoma and Nebraska exhibit a color change to red, pink or even purplish shades when heat-treated (Johnson *et al.* 1972; Grosser 1973; Banks 1974; Hartley 1974; Carlson and Peacock 1977a). It is likely that many of the reddish, pinkish and purplish cherts in the 1978-1979 Clinton sample also are heat-treated.

Historic artifacts were systematically classified according to their functional attributes using the system listed in Table 4.

All soil samples from the test excavations were water screened in an attempt to recover botanical remains and microliths. The water screening process consisted of placing each soil sample on a stack of screens of decreasing mesh size and running water through the sample. Very few water screened soil samples contained material suitable for study. When they did, the materials were dried, bagged by screen size and reserved for analysis.

RESULTS

Description of Test Excavated Sites

The 19 sites test excavated during the field survey of the Clinton Lake project are described in the following pages. Although the general locations of these sites are shown in Plate 7, specific details of individual site locations are not included in these descriptions so as to protect the resources from vandalism and looting. Sites are discussed in sequential order by trinomial numbers assigned by the Kansas State Historical Society.

14D03

This site is located along the northern edge of a cultivated second terrace overlooking the Deer Creek floodplain. It extends over roughly 15,000 square meters with estimated dimensions of 100 x 150 meters. At an elevation of 268 to 274 meters (880 to 900 feet), it is 50 meters west of site 14D0154.

Site 14D03 is the only site tested during this project which was discovered prior to 1976. It was first investigated by Chism (1966) and was test excavated by Johnson (1968) at the base of the terrace. Initially, the site was thought to occupy the floodplain at the base of the terrace. However, subsequent testing and surface examinations indicated that the site was located primarily on the second terrace. Chism's investigation (1966) uncovered evidence of Archaic, Plains Woodland and Central Plains occupations. Johnson's (1968) excavations revealed that the site displayed a shallow profile and was probably a Central Plains manifestation. Also, a graduate student at the University of Kansas supervised selective surface collections at site 14D03 in the fall of 1978. The artifacts collected during his work are now curated at the University of Kansas and include a drill base, a flake tool, two unidentified projectile points, a grit tempered, cord marked pottery sherd, and an obsidian flake (Ziegler, personal communication).

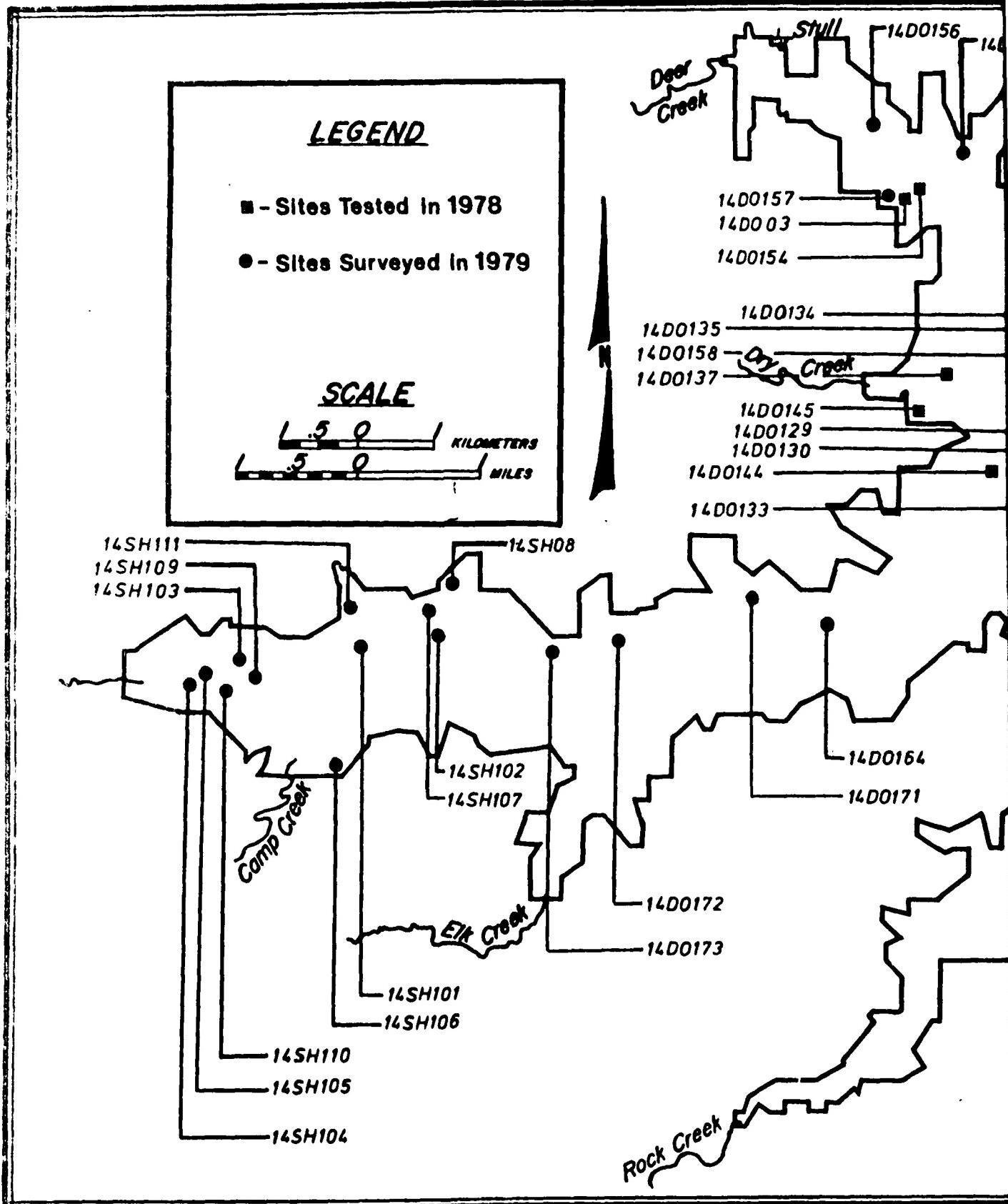
In 1978, surface collections and shovel test pit excavations were conducted at the site and two 1 x 1 meter test pits were opened as a result of these procedures. Both of the test pits, one located in the cultivated field and one along a clearing next to the wooded terrace edge, were placed according to judgmental criteria. Test A was placed in an area cleared of trees at the north end of the site, and artifacts were recovered to a depth of 33 centimeters. Test B was placed south of test A, in a cultivated field, and yielded artifacts to a depth of 26 centimeters. Neither test pit was excavated to sterile soil before the close of the 1978 field season; therefore, plastic tarps were placed in the test pits and covered with soil to protect the integrity of the cultural strata.

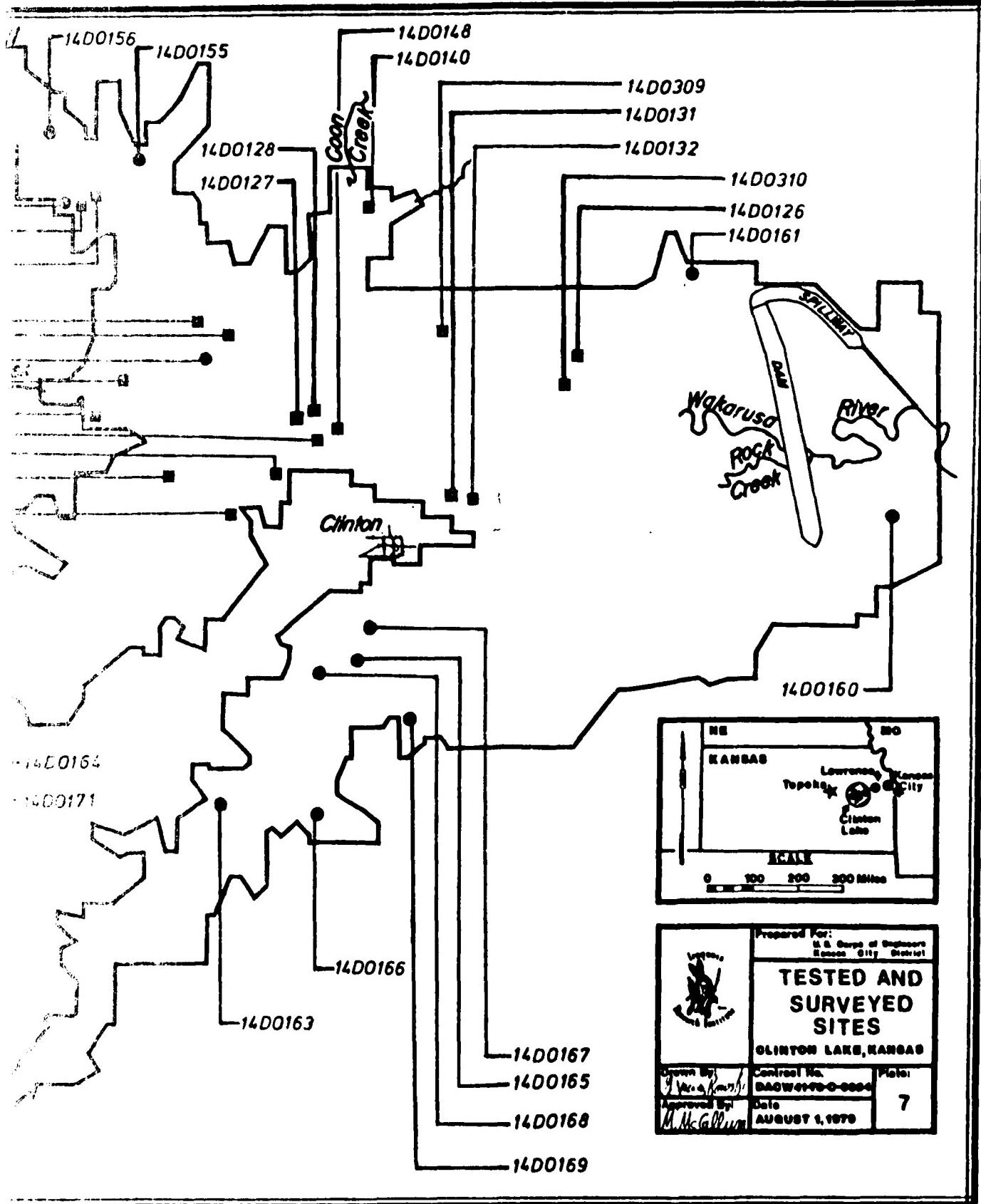
In 1979, excavations of the test pits were completed. Test A was excavated to its conclusion at a depth of 53 centimeters. No artifacts were recovered in the two lower 10 centimeter levels. Test B was excavated to a depth of 45 centimeters but was also sterile of cultural material. A summary of excavations is listed in Table 8.

TABLE 8

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D03

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-13 cm	39 interior flakes 3 primary decortication flakes 4 secondary decortication flakes
	II	13-23 cm	sterile
	III	23-33 cm	1 biface fragment
	IV	33-43 cm	sterile
	V	43-53 cm	sterile
B	I	0-19 cm	1 projectile point base 1 small biface 1 flake end scraper 1 utilized blade 1 spokeshave 4 utilized flakes 84 interior flakes 13 secondary decortication flakes 4 primary decortication flakes
	II	19-26 cm	1 projectile point 24 interior flakes 1 primary decortication flake
	III	26-35 cm	sterile
	IV	35-45 cm	sterile





The soils found at this site are classified as part of the Vinland-Martin silty clay loam complex. The soil in test A consisted of a silty clay loam in the upper level. The clay content of the soil increased with depth and dark mottling was observed in the deeper, sterile levels. The soils in test B were identical to those found in test A except that a granular clay lens was observed between 25 and 35 centimeters and the mottling in the lower levels was not as pronounced. Plowzone disturbance in both of the tests appears to have been moderate. Historic cultivation has resulted in erosion of portions of the site and possible redeposition along the wooded terrace edge. This is supported by the observed presence of artifacts along the surface of the wooded slope.

Artifacts recovered from the surface of the site and from the shovel tests include six projectile point fragments, a small biface, a biface fragment, three scrapers, seven utilized flakes, a utilized blade, two secondary decortication flakes and 20 interior flakes.

The artifacts recovered from the test pits are listed in Table 9. The collection includes bifaces, a spokeshave, a unifacial scraper, utilized flakes, a utilized blade and lithic debitage. Lithic debitage, which accounts for approximately 94% of the total assemblage, includes interior flakes, primary decortication flakes and secondary decortication flakes. An end scraper from the site is illustrated in Plate 8:G, and one of the utilized flakes is shown in Plate 9:A.

One of the projectile point fragments recovered, shown in Plate 8:A, is morphologically similar to Madison or Fresno points (Bell 1960; Perino 1968). The point, broken below the tip, is triangular in shape with straight to incurvate blade edges and an incurvate basal edge. Another point is the basal fragment of a small, corner notched form similar to the Scallorn point type (Bell 1960). The specimen, which is illustrated in Plate 8:B, has a rounded shoulder with an expanding stem. Triangular, unnotched points typically occur in Plains Village contexts throughout the Plains, and small, corner notched points occur largely during the Plains Woodland Period.

A wide variety of lithic raw materials were recovered from site 14D03. Ten different colors of chert are represented in the assemblage. Approximately 80% of the artifacts are made of common gray, beige, pink and tan cherts. Relatively uncommon chert colors represented include black, red and white cherts. Though an obsidian flake was recovered from the site during Ziegler's surface collections, no obsidian artifacts were yielded during the testing.

The projectile points recovered in 1978 associate this site with the Plains Woodland and Plains Village Periods. A Plains Village occupation of the site is further indicated by the ceramics recovered by Chism (1966) and Johnson (1968).

14D0126

This site lies on a gently sloping ridgetop in the Upland Prairie Ecological Zone of the Wakarusa River Valley. Located at an elevation between 293 to 296 meters (960 to 970 feet), the site overlooks the river valley to the

TABLE 9
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D03

ARTIFACT TYPE	RAW MATERIALS											TOTAL	%
	01	02	03	04	06	07	08	10	12	13			
002	.	.	.	.	.	1	.	.	1	.	2	1.1	
027	.	.	.	.	.	.	1	.	.	.	1	0.5	
028	.	.	.	.	.	1	.	.	.	.	1	0.5	
043	.	.	.	.	.	.	.	1	.	.	1	0.5	
046	1	.	.	.	.	.	.	.	.	.	1	0.5	
051	1	.	.	1	.	2	.	.	.	.	4	2.2	
065	1	.	.	.	.	.	.	.	.	.	1	0.5	
080	1	.	.	.	.	4	.	1	2	.	8	4.4	
081	4	.	.	.	2	6	2	.	3	.	17	9.4	
082	43	2	2	11	2	40	13	15	18	1	147	80.4	
TOTAL	51	2	2	12	4	54	16	17	24	1	183		
%	27.8	1.1	1.1	6.6	2.2	29.5	8.7	9.4	13.1	0.5		100%	

south. The 1976 field survey crew estimated the dimensions of the site as 100 x 200 meters, for an area of approximately 20,000 square meters (Iroquois Research Institute 1977).

Four 1 x 1 meter test pits were excavated at the site in 1978. Test pits A, B and C were randomly placed along high density 1976 survey transects, and test D was placed in an area with a high surface concentration of prehistoric materials. Stratigraphic summaries of the materials recovered from these test excavations are presented in Table 10.

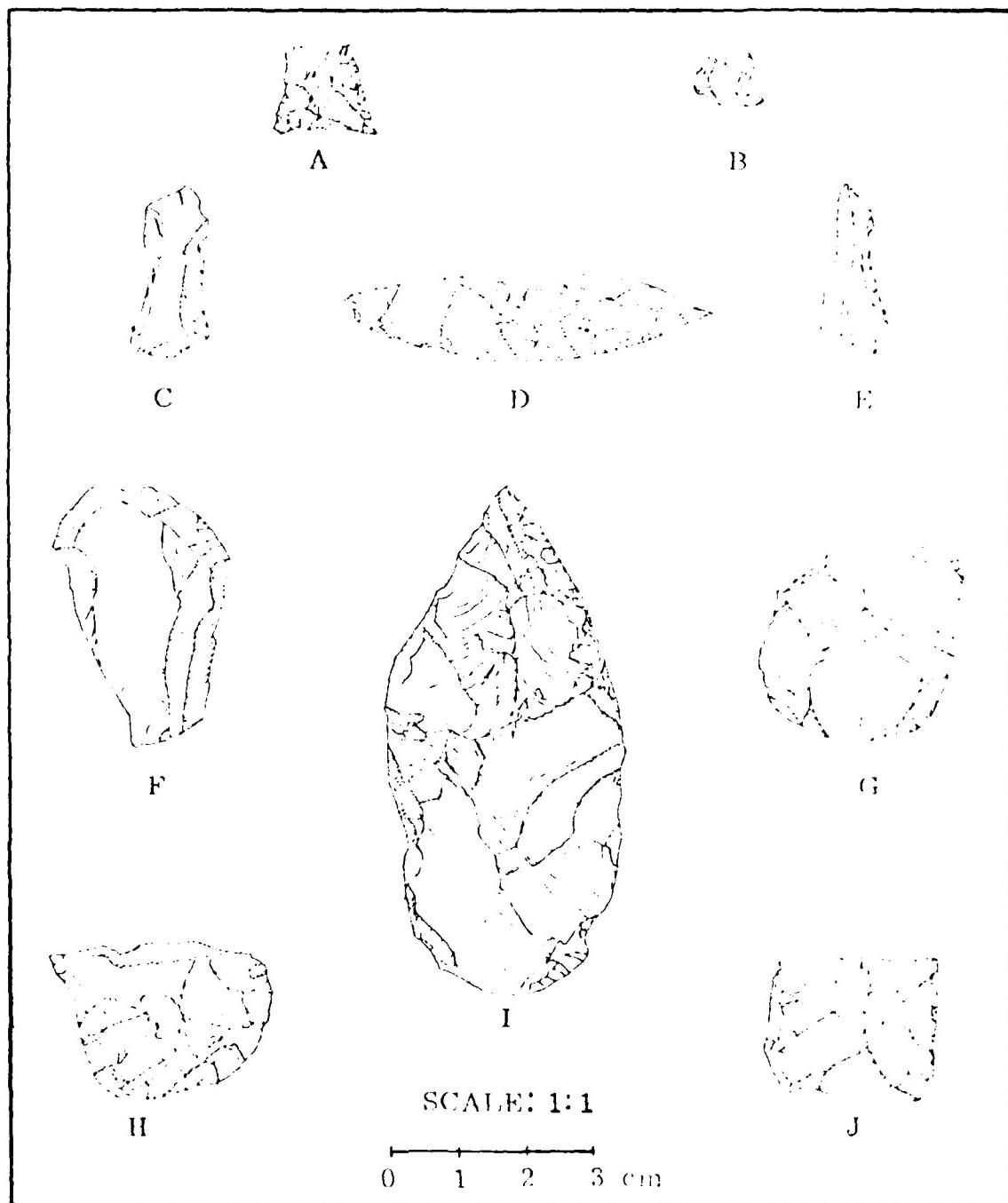


PLATE 8

Chipped Stone Artifacts from 14003.
 (A) Triangular, corner-notched point fragment. (B) Small, utilized flake. (D) Biface fragment. (E) Utilized biface fragment. (F) Bifacial end scraper. (G) Bifacial end scraper. (H) Biface fragment. (I) Biface. (J) Biface fragment.

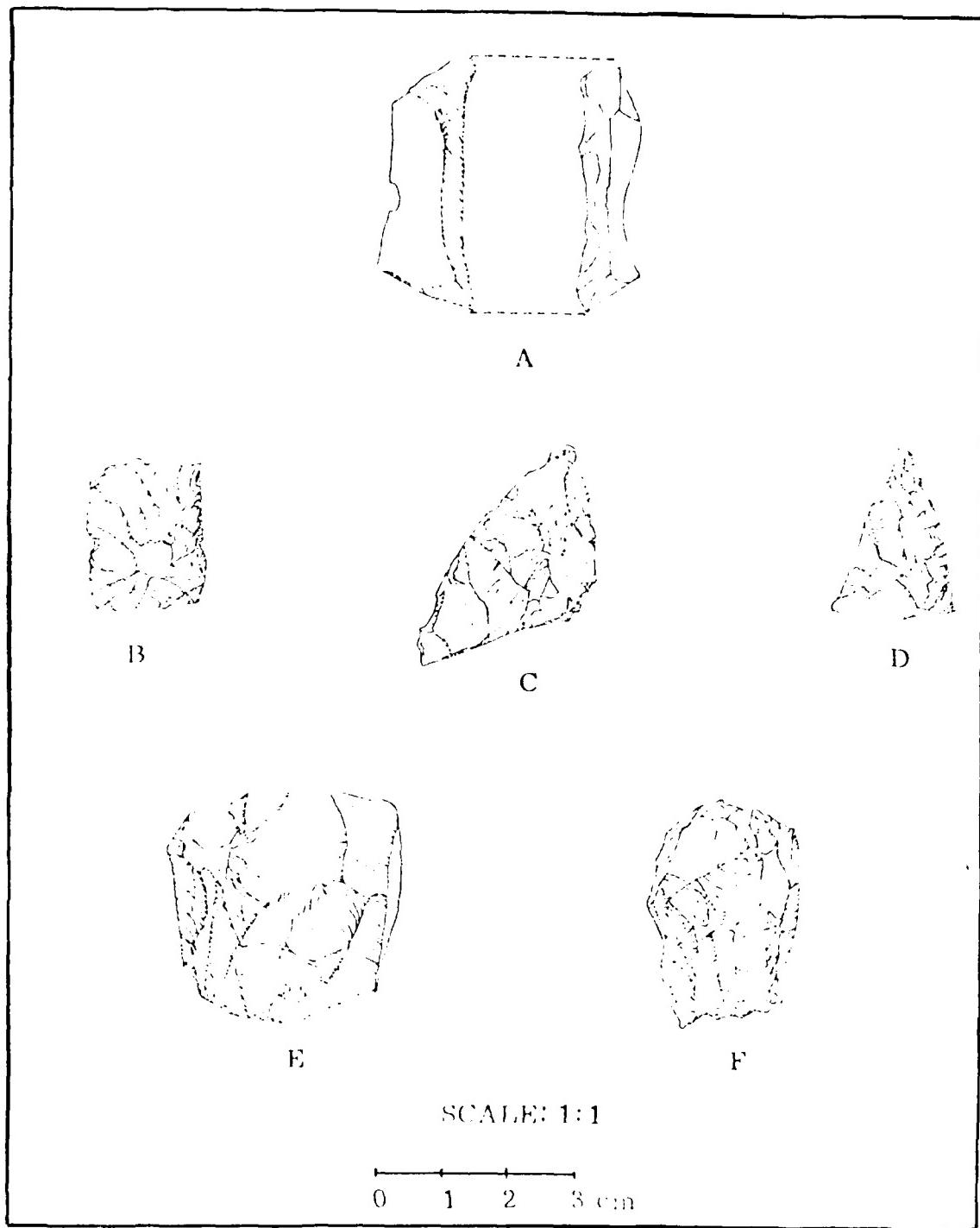


PLATE 9

Chipped Stone Artifacts from 140-3. (A) Chipped flake. (B) Unidentified point-like fragment. (C) Point fragment. (D) Point fragment. (E) Biface. (F) Biface.

TABLE 10
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14bo126

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	sterile
	II	10-20 cm	1 flake tool 1 retouched flake 1 utilized flake 1 unmodified blade 1 primary decortication flake
	III	20-30 cm	2 retouched flakes 2 secondary decortication flakes 2 primary decortication flakes 1 debitage
	IV	30-40 cm	2 retouched flakes 2 debitage 2 unmodified blades 1 primary decortication flake
	V	40-50 cm	1 interior flake 1 primary decortication flake
	VI	50-60 cm	1 secondary decortication flake 1 debitage
B	I	0-20 cm	sterile
	II	20-30 cm	sterile
C	I	0-13 cm	3 retouched flakes 5 utilized flakes 8 debitage
	II	13-23 cm	1 flake tool 1 debitage
	III	23-33 cm	sterile

TABLE 10 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0126

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
D	I	0 - 30 cm	1 spokeshave 1 retouched flake 6 utilized flakes 8 debitage 1 interior flake
	II	30 - 40 cm	1 flake side scraper

Artifacts were recovered from arbitrary 10 centimeter levels extending to a depth of 60 centimeters in test A. Test B was sterile to its conclusion at 30 centimeters while tests C and D yielded artifacts to depths of 23 and 40 centimeters respectively. No prehistoric features or structural remains were recovered during these excavations. Artifacts were recovered beneath the apparent plowzone, but they may have been subjected to natural vertical mixing which occurs in certain soils in this region.

The Martin-Oska silty clay loam soil complex which is found on this upland slope has resulted from the weathering of underlying shales and limestones. These soils commonly have fragments of chert and limestone present at or near the surface and have a moderate to high shrink swell potential and an acid to slightly alkaline pH. This area has been moderately eroded as a result of cultivation during the historic period. In each of the four test excavations, the plowzone ranged between 15 and 30 centimeters in depth with little variation in color. The observed soil colors at the site ranged from dark brown to dark reddish brown.

The small artifact assemblage of 59 lithic artifacts from 14D0126 contains a spokeshave, a unifacial scraper, 12 utilized flakes, two flake tools, nine retouched flakes, 3 unmodified blades and 31 pieces of debitage. The debitage includes primary and secondary decortication flakes, interior flakes and other debitage. Similar types and quantities of artifacts were recovered during the 1976 survey (Ibid.). The lack of diagnostic artifacts from this site has prevented assignment of a temporal position. The majority of the 1978 collection is comprised of commonly occurring tan and gray cherts. Artifact types and raw materials recovered from excavations are summarized in Table 11.

In addition to the artifacts, two carbonized seeds were recovered from a soil sample taken from the 60 centimeter level of pit A. One of these seeds has been identified as Lespedeza sp., specifically, Korean lespedeza, which was not

introduced in the area until the second quarter of the 20th century. The other recovered seed is a species of Carex. This species was not commonly used by prehistoric peoples. It is likely that both seeds were deposited either by insects or rodents, or in shrinkage cracks of the soil profile.

TABLE 11
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0126

ARTIFACT TYPES	RAW MATERIALS				TOTAL	%
	01	07	08	12		
043	.	1	.	.	1	1.7
047	.	.	.	1	1	1.7
051	.	12	.	.	12	20.3
052	.	.	.	2	2	3.4
053	1	3	.	5	9	15.2
060	.	3	.	.	3	5.1
080	1	2	.	2	5	8.5
081	.	1	.	2	3	5.1
082	.	2	.	.	2	3.4
086	2	2	1	16	21	35.6
TOTAL	4	26	1	28	59	
%	6.8	44.1	1.7	47.4		100%

14D0127

This site is located at an elevation of 290 meters (950 feet) on a lobe of a gently sloping upland ridge above the confluence of the Wakarusa River and Deer Creek. Several other prehistoric sites are nearby on this same ridge: 14D0128, 14D0129 and 14D0148. The site area lies within a previously cultivated field which is now covered with tall grasses and other herbaceous

vegetation. Surficial examination conducted during the 1976 survey indicated that the site may extend into the treeline along the northern and western periphery of the site and that it has approximate dimensions of 150 x 50 meters or an area of 7,500 square meters (Iroquois Research Institute 1977).

Two 1 x 1 meter excavation units were placed at the site in 1978. Test pit A was randomly placed along a high density 1976 survey transect. On the basis of high yield shovel tests conducted in 1976, test pit B was placed in the northwest quadrant of the site, an area which appeared to have been little disturbed by agricultural activities and erosion due to its proximity to the treeline. Both tests were excavated in arbitrary 10 centimeter levels. Of the three levels excavated in test pit A, only the upper 10 centimeter level yielded artifacts. Test pit B was excavated to a depth of 40 centimeters with prehistoric artifacts recovered from the first three 10 centimeter levels. A stratigraphic summary of recovered cultural materials is presented in Table 12.

The soil at the site is a slightly acid to neutral Morrill clay loam, formed from glacial till. The soil is deep, well-drained and moderately eroded. Root intrusions were observed throughout test B. As the site has a slope of about four percent to the east, erosion induced by historic period cultivation may have removed a significant portion of the topsoil. No plowzone was distinguished in test pit A and a 9 centimeter deep plowzone was encountered in test pit B. A fairly dense concentration of lithic debitage was observed in an erosional drainage sloping to the east, and a projectile point fragment was recovered from this location. Test pit B was located above the

TABLE 12

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0127

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	1 debitage
	II	10-20 cm	sterile
	III	20-30 cm	sterile
B	I	0-10 cm	4 debitage
	II	10-20 cm	1 utilized flake 1 secondary decortication flake 2 debitage
	III	20-30 cm	3 debitage
	IV	30-40 cm	sterile

drainage in an area relatively free of erosion. Test pit A, located to the east of test pit B, had a shallower cultural horizon, probably as a result of erosion. This suggests that the eastern periphery of the site has been affected by erosion.

Only twelve prehistoric lithic artifacts were recovered from the excavation of the two test pits. The artifact assemblage includes a utilized flake, a secondary decortication flake and 10 pieces of other lithic debitage. Artifacts recovered at the site during the 1976 survey include cores, a biface, unifacial scrapers and lithic debitage (*Ibid.*). Common gray and tan cherts comprise the majority of the lithic collection. Artifacts and raw materials excavated are summarized in Table 13.

TABLE 13

INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0127

ARTIFACT TYPES	RAW MATERIALS				TOTAL	%
	03	07	08	12		
051	.	1	.	.	1	8.3
081	.	1	.	.	1	8.3
086	1	.	4	5	10	83.3
TOTAL	1	2	4	5	12	
%	8.3	16.7	33.3	41.7		100%

One expanding stemmed, concave based projectile point fragment, shown in Plate 10:A, was selectively recovered from the surface. The point is descriptively similar to the Edgewood point form (Marshall 1972). The temporal range of this type has not been clearly defined in the eastern Plains. However, the Edgewood point has been associated with the Archaic Period in Texas and Oklahoma (Hughes 1972). Together with the absence of ceramics or small points in the assemblage, this artifact may indicate the presence of an Archaic occupation at 14D0127.

14D0128

This prehistoric site is near the edge of a level lobe of ridgeline which extends northward into the Wakarusa River Valley at an elevation between 283 and 290 meters (930 to 950 feet). Sites 14D0127, 14D0129 and 14D0148 are

located on the same ridgeline. From this vantage point there is an excellent view of the Wakarusa Valley to the east, west and north. Site 14D0128 was discovered in 1976 and was subjected to surface collecting and shovel testing to locate artifact concentrations within the large site area (Iroquois Research Institute 1977). The vegetative cover of the site primarily consists of herbaceous vegetation and trees on the northern edge of the ridge. The dimensions of the site are estimated to be 350 x 200 meters. The site covers an area of roughly 70,000 square meters.

Because of the relatively large size of the site and the quantity of materials recovered from the surface during the 1976 survey, this site was

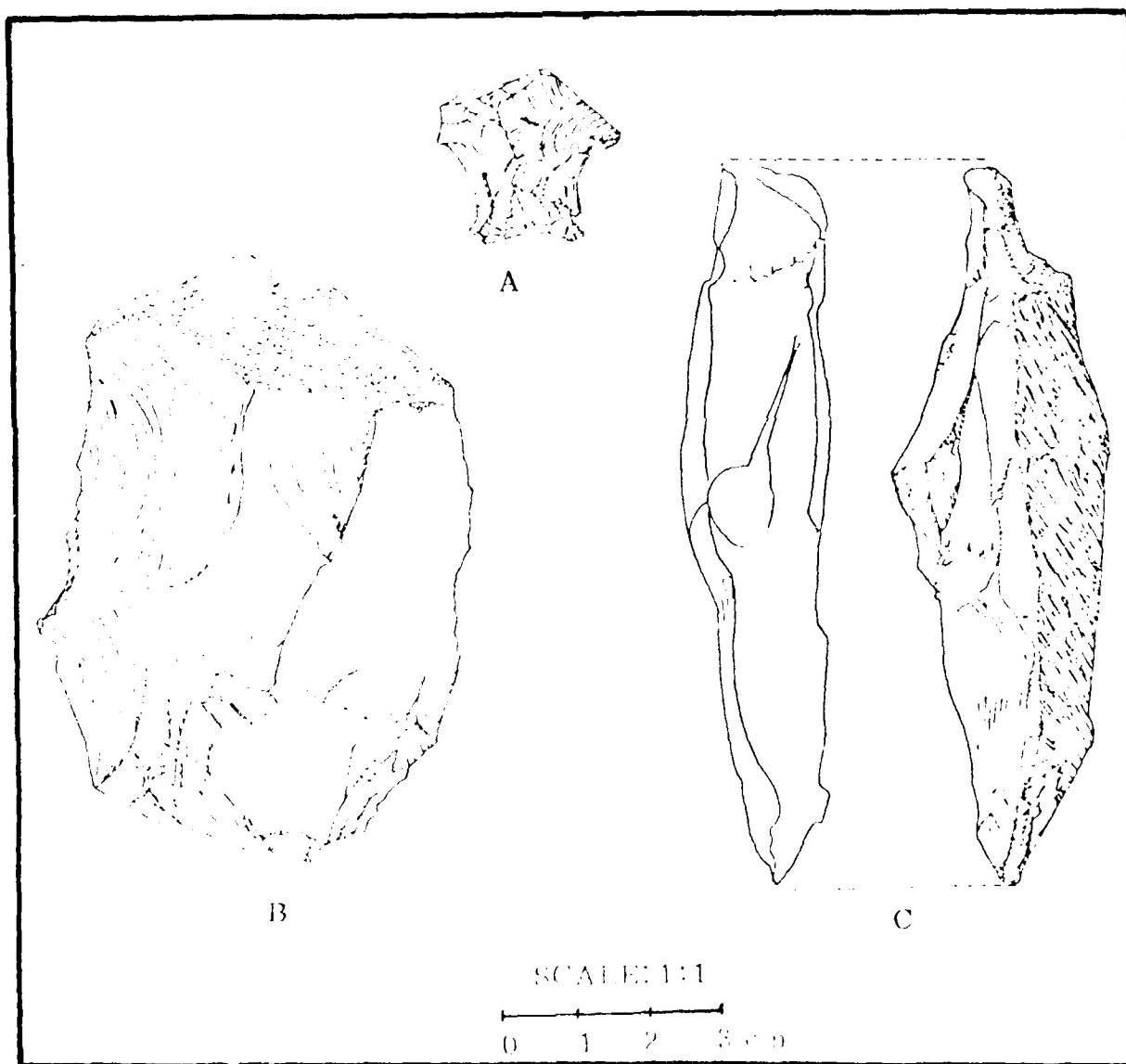


PLATE 10

Figure 10. Artifacts from 14D0128. A = fragment of a pot rim; B = fragment from 14D0128; C = fragment from 14D0128; D = fragment from 14D0128.

allocated 16 1 x 1 meter test excavations. Test pits A through L were randomly placed along plowed transects utilized in the 1976 survey. Test pits M through P were excavated near the edges of the ridgeline in a wooded area in order to define the northern extent of the site. The only excavations to reach depths of 60 centimeters or below were tests B, C and N. The deepest occurrences of artifacts were in tests B and N, where artifacts occurred to depths of 63 and 72 centimeters respectively. In tests G, L and P there were shallow artifact bearing levels with the artifacts limited to the upper 24 centimeters, well within the plowzone. Test M was sterile, and the other nine tests produced artifacts to maximum depths of between 31 and 52 centimeters below the surface.

Except for test excavations placed at the terrace edge and test pit G, all test pits produced evidence of a plowzone extending to a depth between 20 and 35 centimeters. Test pit G was placed in an area which had been severely eroded so the present plowzone is probably thinner than it was previously. Those tests placed within the wooded areas on the ridge edge exhibited a topsoil with little evidence of plowing. This reflects the avoidance of plowing that area during the historic period in order to prevent erosion. It is evident that there are artifacts below the plowzone at this site, as artifacts were found to a depth of 72 centimeters in test N. Additionally, the deposits of cultural materials are less disturbed at the terrace edge than in the lower, cleared and cultivated areas of the site. There were no features or structural remains encountered during the testing procedures.

Site 14D0128 is located on Sharpsburg silt loam soil which has formed from loess derived from nearby glacial till. This soil is moderately well drained and has been slightly eroded as a result of historic period cultivation. The 16 test excavations revealed considerable localized disturbance of the site area as a result of rodent and insect burrowing and root intrusions. There also appears to have been a reduction of slight elevation differences within the site area as a result of modern agricultural practices. This has resulted in the increased depth of the plowzone at some test locales. Soil colors are fairly uniform throughout the site. Upper soil strata colors range from very dark gray brown to dark reddish brown and dark yellowish brown while the subsoils range from dark yellowish brown to strong brown or reddish brown.

Occupation during the Late Archaic or Plains Woodland Period is indicated by diagnostic evidence gathered during the 1976 and 1978 field seasons. Two large, expanding stemmed points were recovered during the 1976 survey (Ibid.). A large, expanding stemmed, convex based point was also recovered on the surface in 1978. This point, illustrated in Plate 11:D, is similar to the Williams type (Bell 1960). In southeastern Kansas, the Williams type has been placed in the Cuesta phase (Marshall 1972). Elsewhere in the Southern Plains, similar types are reported from Plains Woodland and late Archaic complexes (Hartley 1974). A full-grooved granite axe fragment recovered in 1978 from the site's surface supports dating this site to the Plains Woodland Period (Johnson 1968). The axe is illustrated in Plate 11:C.

Excavated materials from site 14D0128 are listed in the stratigraphic summaries in Table 14. Approximately 74% of the excavated material consists of debitage and cores. Two cores from the site are illustrated in Plate 12. The

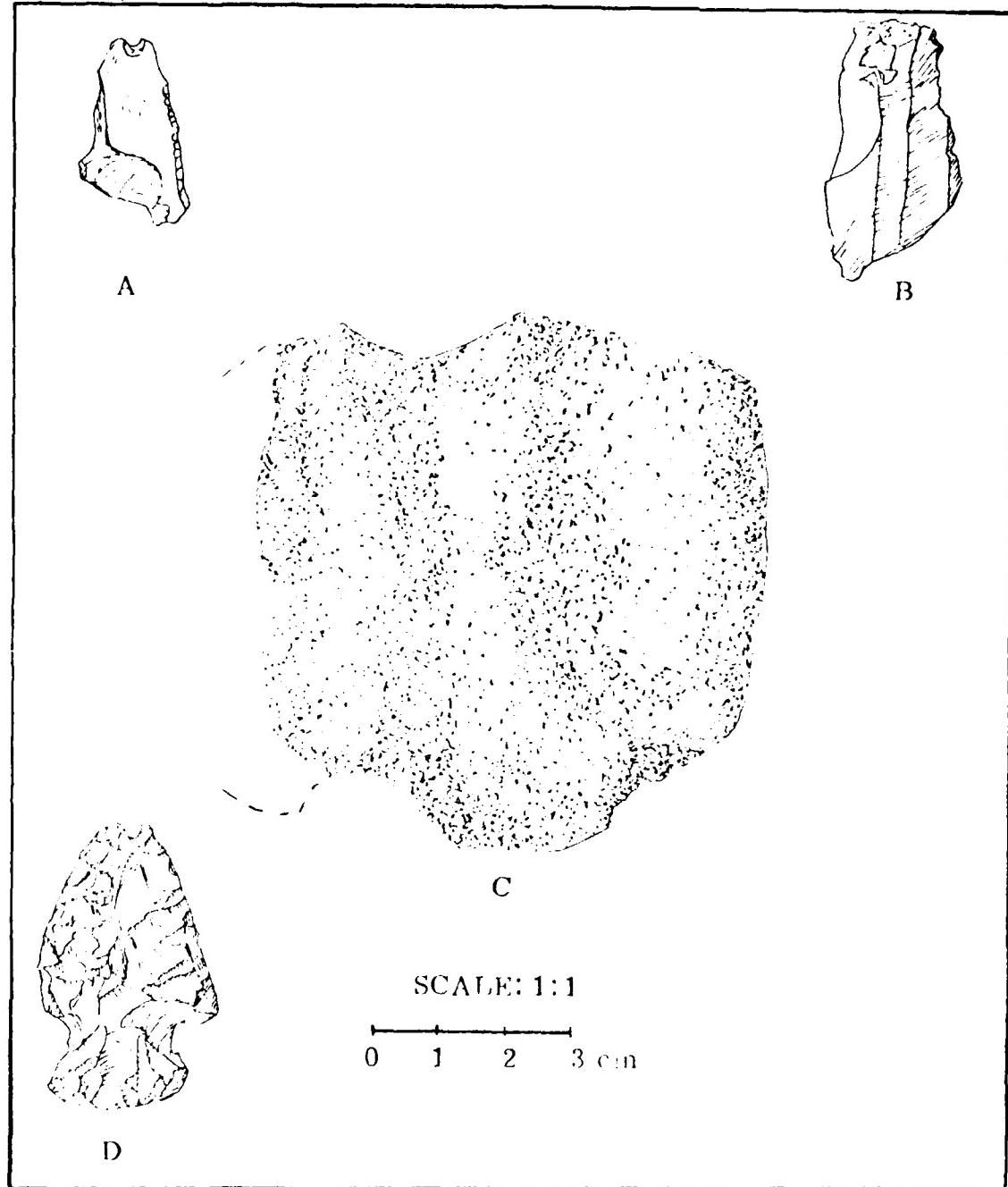


PLATE 11

(A) Small utilized flake. (B) Utilized blade. (C) Flake and (D) bifacially modified fragment.

remainder of the assemblage consists of utilized flakes, retouched flakes, unmodified blades, bifacial fragments, and other modified flakes and blades. Similar types of artifacts were collected during the 1976 survey (Iroquois Research Institute 1977). The cherts recovered from this site are primarily of the gray fossiliferous type commonly found at prehistoric sites in the Wakarusa

Valley. The rare cherts found at this location, including black, red, white and banded cherts, may suggest some importation or trade for non-local resources. The artifacts and raw materials recovered are summarized in Table 15.

TABLE 14
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 1400128

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-19 cm	1 utilized blade 1 flake tool 4 utilized flakes 11debitage
	II	19-29 cm	1 biface fragment 1 utilized flake 3debitage 2 interior flakes
	III	29-39 cm	3debitage 2 interior flakes
	IV	39-49 cm	2 utilized flakes 2debitage
	I	0-23 cm	1 retouched flake 1 utilized flake 1 flake side scraper 18debitage
	II	23-33 cm	3debitage 4 interior flakes
B	III	33-43 cm	2debitage
	IV	43-53 cm	2 interior flakes
	V	53-62 cm	2 utilized flakes 1debitage
	VI	63-73 cm	sterile
C	I	0-10 cm	4 retouched flakes 3 utilized flakes 13debitage 16 interior flakes 1 primary decortication flake

TABLE 14 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0128

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
C	II	10-20 cm	2 retouched flakes 10 utilized flakes 25 debitage 1 unmodified blade 11 interior flakes 1 primary decortication flake
	III	20-30 cm	3 utilized flakes 10 debitage 2 interior flakes 1 secondary decortication flake
	IV	30-40 cm	Artifacts missing.
	V	40-50 cm	1 utilized flake 1 interior flake 1 primary decortication flake
	VI	50-60 cm	sterile
	I	0-19 cm	2 retouched flakes 1 flake tool 4 utilized flakes 7 debitage 1 interior flake
D	II	19-29 cm	1 debitage 1 interior flake
	III	29-39 cm	1 retouched flake 1 utilized flake 1 debitage
	IV	39-49 cm	sterile
E	I	0-27 cm	5 retouched flakes 1 flake end scraper 10 utilized flakes 11 debitage 11 interior flakes

TABLE 14 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0128

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
E	II	27-37 cm	1 utilized flake 2 debitage 1 primary decortication flake
	III	37-47 cm	3 debitage
	I	0-22 cm	2 retouched flakes 13 utilized flakes 11 debitage 9 interior flakes 2 primary decortication flakes
F	II	22-32 cm	1 utilized flake 2 debitage
	III	32-42 cm	1 utilized flake 5 debitage
	I	0-14 cm	1 retouched flake 3 utilized flakes 5 debitage 2 interior flakes
G	II	14-24 cm	3 utilized flakes 1 debitage
	III	24-34 cm	sterile
	I	0-21 cm	3 retouched flakes 10 utilized flakes 16 debitage 14 interior flakes
H	II	21-31 cm	1 debitage 3 interior flakes
	III	31-41 cm	sterile
	IV	41-51 cm	sterile

TABLE 14 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0128

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
I	I	0-22 cm	2 utilized flakes 6 debitage
	II	22-32 cm	1 retouched flake 2 debitage 1 interior flake
	III	32-42 cm	sterile
	IV	42-52 cm	2 utilized flakes 1 debitage
J	I	0-31 cm	1 core fragment 1 retouched flake 11 utilized flakes 12 debitage 3 interior flakes
	II	31-41 cm	1 utilized flake 2 debitage
	III	41-51 cm	2 interior flakes
K	I	0-24 cm	1 flake-side scraper 4 utilized flakes 1 interior flakes 21 debitage
	II	24-34 cm	2 utilized flakes 11 debitage
	III	34-44 cm	2 debitage
L	I	0-22 cm	2 utilized flakes 1 interior flake 1 debitage
	II	22-32 cm	sterile
	III	32-42 cm	sterile

TABLE 14 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0128

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
M	I	0-22 cm	sterile
	II	22-32 cm	sterile
	III	32-42 cm	sterile
N	I	0-12 cm	1 biface fragment 1 retouched flake 3 utilized flakes 10 debitage 16 interior flakes
	II	12-22 cm	1 core - other 4 utilized flakes 8 debitage 14 interior flakes
	III	22-32 cm	1 discoidal core 1 utilized flake 7 debitage 3 interior flakes
	IV	32-42 cm	1 core fragment 1 utilized flake 5 debitage 1 interior flake
	V	42-52 cm	1 retouched flake 6 debitage 1 interior flake
	VI	52-62 cm	2 debitage
	VII	62-72 cm	1 utilized flake 3 debitage
O	I	0-10 cm	1 core 1 utilized flake 6 debitage
	II	10-15 cm	1 retouched flake 2 utilized flakes 4 interior flakes

TABLE 14 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0128

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
0	III	15-25 cm	2 retouched flakes 1 utilized flake 1 unmodified blade 5debitage 3 interior flakes
	IV	25-35 cm	1debitage 1 primary decortication flake
	V	35-45 cm	sterile
P	I	0-10 cm	7 utilized flakes 15debitage 18 interior flakes
	II	10-20 cm	5 utilized flakes 4debitage 9 interior flakes
	III	20-30 cm	sterile

14D0129

This prehistoric site is in a field near the highest point, 293 to 296 meters (960 to 970 feet), of the broad Upland Prairie to the south of the Wakarusa River. Sites 14D0127, 14D0128, 14D0129 and 14D0148 are clustered in this upland field, and site 14D0129 is separated from 14D0128 to the northeast by an area some 100 meters in length in which no cultural material was found. At one time under cultivation, the site area is now covered with colonizing grasses and weeds. The site dimensions have been estimated to be 100 x 125 meters, covering an area of approximately 12,500 square meters.

Four 1 x 1 meter test pits were excavated at this site. Two of the test pits, B and D, were randomly located along 1976 survey transects which had a high density of artifacts. Test pits A and C were selectively placed to delineate the periphery of the site. The plowzone layer varied from 20 to 28 centimeters in depth while excavated depths ranged from 38 to 62 centimeters. All four test pits yielded artifacts below the plowzone, suggesting the possibility of an undisturbed cultural horizon. A stratigraphic summary of recovered artifacts is presented in Table 16.

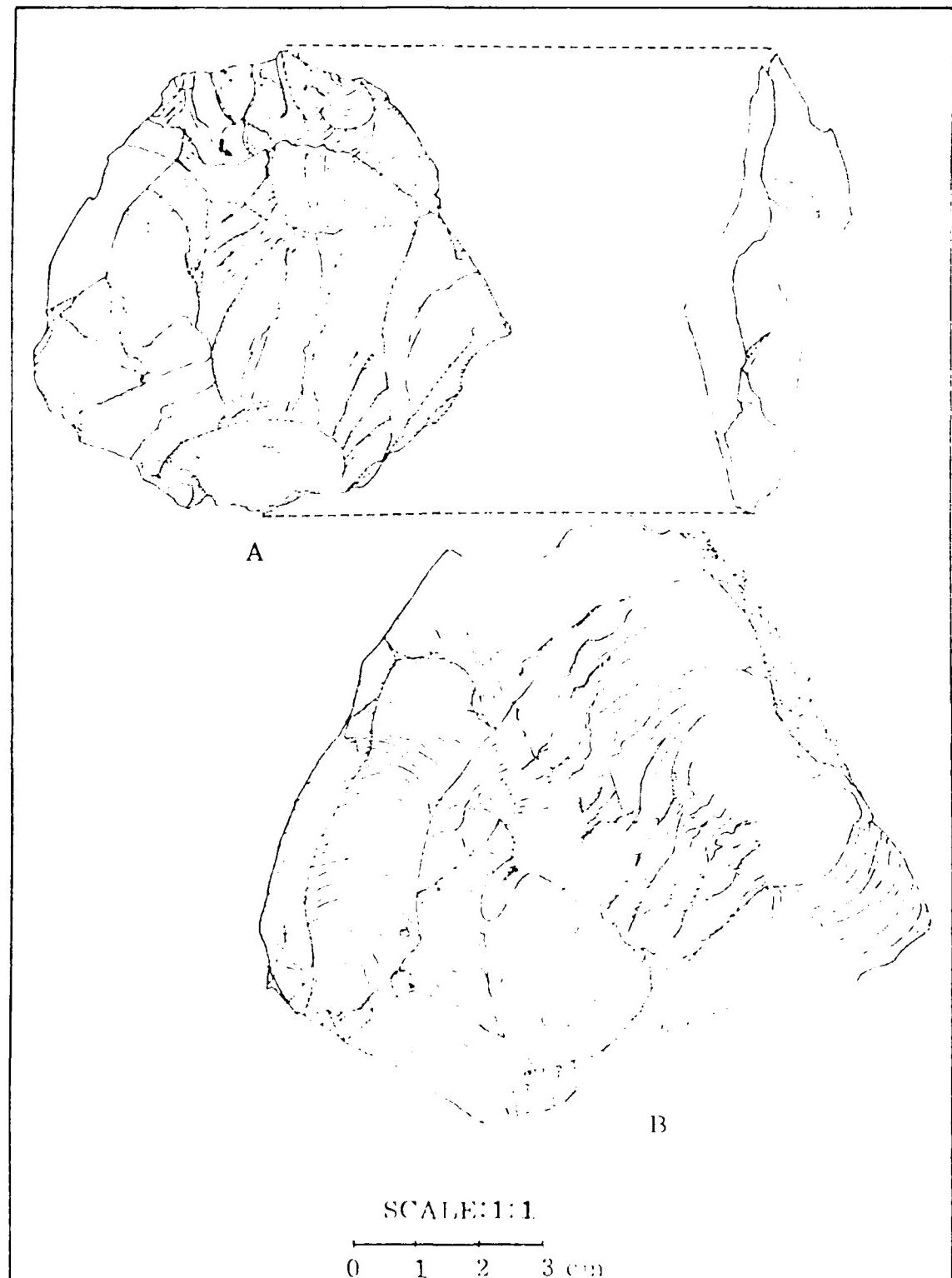


PLATE 12

Casts from 1460128. (A) - Loxocarya. (B) - Carex.

TABLE 15

INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14DO128

ARTIFACT TYPES	RAW MATERIALS													TOTAL	%	
	01	02	03	04	05	06	07	08	09	10	11	12	13	15		
028	.	.	.	.	.	.	.	2	.	.	.	.	.	.	2	0.3
046	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	0.2
047	1	.	.	.	.	.	.	.	.	.	.	1	.	.	2	0.3
051	13	.	1	6	.	8	34	22	1	2	.	37	.	.	124	19.7
052	1	.	.	.	.	.	1	.	.	.	.	.	.	.	2	0.3
053	1	.	.	1	1	.	14	.	.	.	.	10	1	.	28	4.5
060	1	.	.	.	.	.	.	.	.	.	.	1	.	.	2	0.3
065	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	0.2
073	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	0.2
076	.	.	.	.	.	.	1	.	.	.	.	1	.	.	2	0.3
077	.	.	.	.	.	.	1	.	.	.	.	2	.	.	2	0.3
080	1	.	.	.	.	.	4	2	.	.	.	.	1	.	8	1.3
081	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	0.2
082	18	2	1	2	1	31	35	43	4	3	.	25	.	.	165	26.3
086	16	1	1	4	1	12	105	66	5	13	1	59	2	1	287	45.7
TOTAL	52	3	3	14	3	51	197	135	10	18	1	136	4	1	628	
%	8.3	0.5	0.5	2.2	0.5	8.1	31.4	21.5	1.6	2.9	0.2	21.6	0.6	0.2		100%

The Woodson silt loam soil at the site is deep, somewhat poorly drained and moderately eroded as a result of historic period cultivation. This soil has a high shrink swell potential. Thus, small artifacts on the ground surface may have been mixed with earlier deposits as a consequence of falling in shrinkage cracks. The vertical mixing of the soil profile which occurs in such soils over long periods of time can also alter or destroy cultural features.

Approximately 15 to 20 specimens of carbonized seeds were recovered from soil samples taken from Level II of test pit C beneath the plowzone. The seeds are of the genus Draba of the mustard family, a common weed of field and waste places over much of temperate North America. The small seeds, less than one millimeter in diameter, could have been deposited at this shallow depth below the plowzone by natural causes. Many species of plants in the mustard family produce hard seeds which can persist in soils for as long as several decades and still germinate and grow. Presently available data indicate that the sub-plowzone context within which these organic remains were recovered is not of any significance to studies of prehistoric subsistence activities.

TABLE 16
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0129

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-28 cm	4 retouched flakes 14 interior flakes
	II	28-38 cm	1 retouched flake 1 secondary decortication flake
B	I	0-22 cm	20 utilized flakes 41 interior flakes
	II	22-32 cm	sterile
C	III	32-42 cm	2 interior flakes
	I	0-20 cm	2 utilized flakes 15 interior flakes 1 secondary decortication flake
C	II	20-30 cm	1 interior flake
	III	30-40 cm	sterile
D	I	0-22 cm	3 utilized flakes 18 interior flakes 2 secondary decortication flakes
	II	22-32 cm	1 utilized flake 4 interior flakes 1 secondary decortication flake
D	III	32-42 cm	1 interior flakes
	IV	42-52 cm	sterile
D	V	52-62 cm	sterile

A total of 132 prehistoric artifacts was recovered from the investigation of this site. Of that total, 101 artifacts consist of lithic debitage while the remainder are utilized or retouched flakes. The majority of the material is commonly occurring gray, pink and tan cherts. Artifacts and raw materials recovered from the site are summarized in Table 17. The highest concentration of artifacts was found in test pit B, which lies closest to a slight rise in the

field. In the four test pits, all but six specimens of lithic debitage were recovered from within the plowzone. During the 1976 survey, cutting and scraping tools, core fragments and flaking debris were recovered (Iroquois Research Institute 1977). A cultural affiliation cannot be assigned to this site due to the absence of diagnostic artifacts.

TABLE 17
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0129

ARTIFACT TYPES	RAW MATERIALS					TOTAL	%
	01	04	07	08	12		
051	1	.	17	6	2	25	19.7
053	.	.	4	.	1	5	3.8
061	.	.	4	1	.	5	3.8
082	2	2	42	48	2	96	72.7
TOTAL	3	2	67	55	5	132	
%	2.3	1.5	50.7	41.7	3.8		100%

14D0130

Site 14D0130 is located at an elevation of 290 to 293 meters (950 to 960 feet) on a nearly level ridgeline overlooking the Wakarusa River to the northwest. The site, which is located in a cultivated field, was identified in 1976 by a light surface scatter of lithic artifacts. Shovel test investigations were conducted at this site during the 1976 field season and the site dimensions were estimated to be 75 x 75 meters, for a total area of approximately 5,625 square meters (Iroquois Research Institute 1977).

In 1978 two 1 x 1 meter excavation units were placed within the site to ascertain whether or not cultivation had totally disturbed the cultural deposit. Test pit A was randomly placed along a high artifact density transect while test pit B was placed in the proximity of high artifact yield shovel tests. Test pit A was excavated to a depth of 42 centimeters and test pit B was excavated to 32 centimeters. In both excavations, the plowzone extended to a depth of approximately 25 centimeters. No artifacts were recovered below the plowzone in either of the two test pits. A stratigraphic summary of the recovered artifacts is presented in Table 18.

The Sharpsburg silt loam soil at the site was formed in loess and has been slightly eroded as a consequence of modern cultivation. In both test pits the

TABLE 18
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0130

TEST PAT	LEVEL	DEPTH	MATERIALS RECEIVED
A	I	0-22 cm	2 utilized flakes 3 interior flakes 2 secondary decondition flakes
	II	22-32 cm	1 interior flake
	III	32-42 cm	sterile
B	I	0-22 cm	9 interior flakes
	II	22-32 cm	sterile

TABLE 19
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0130

ARTIFACT TYPES	RAW MATERIALS		TOTAL	%
	07	08		
051	2	•	2	10.5
081	2	•	2	10.5
082	8	1	15	79.0
TOTAL	12	1	19	
%	63.2	36.8		100.0

AD-A148 690

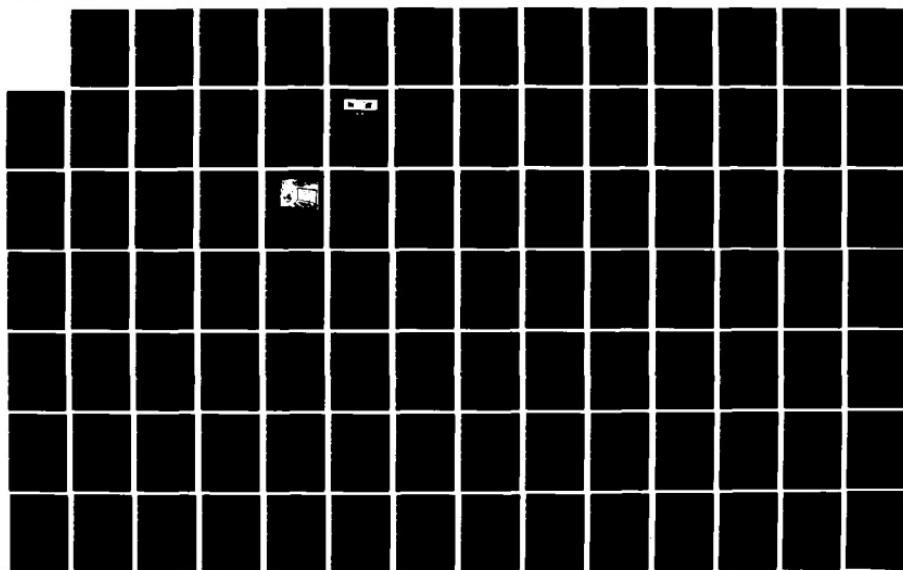
SURVEY AND TESTING OF ARCHEOLOGICAL RESOURCES AT
CLINTON LAKE KANSAS 1978-1979(U) IROQUOIS RESEARCH INST
FAIRFAX VA M NATHAN AUG 80 DACW41-78-C-0054

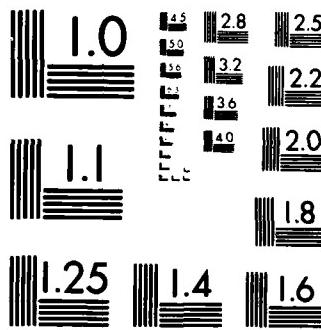
2/4

UNCLASSIFIED

F/G 5/6

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

upper soil horizon, the plowzone, was dark grayish brown, and the subsoil was dark brown, with a moderate amount of organic matter.

Nineteen prehistoric artifacts were recovered from the testing of this site. As can be seen in Table 19, all of the artifacts in the collection are made of gray and pink cherts. Seventeen of the artifacts are lithic debitage and two are utilized flakes. No culturally diagnostic artifacts were identified.

Two large, expanding stemmed projectile points were recovered during the 1976 surface collection of the site (*Ibid.*). Similar items have been assigned to the Woodland, or Plains Woodland, Period in southeastern Kansas (Marshall 1972). A total of 48 artifacts were collected during the 1976 survey. In addition to the projectile points, three bifaces, a core fragment, a modified flake and a relatively high percentage of lithic debitage were collected (Iroquois Research Institute 1977).

14D0131

This site is located along the edge of a broad ridgetop at an elevation of 290 to 293 meters (950 to 960 feet) and overlooking the Wakarusa River to the north. During the initial site investigation in 1976, the ground surface was covered by tall grasses which obstructed visibility (Iroquois Research Institute 1977). Subsequent construction activity has cleared the vegetation along this section of the ridgetop. The site measures approximately 20,000 square meters, extending for 200 meters along the east-west ridge with a maximum width of 100 meters. Site 14D0132, located 200 meters to the east, may be an additional component of site 14D0131.

Four 1 x 1 meter test pits were excavated at this site. Test pits A, B and C were randomly placed along the 1976 survey transects. Test Pit D was selectively placed in an area of apparent high artifact density within the boundaries of the site.

The depths of the excavations ranged from 30 centimeters in tests A and D to 50 centimeters in test pit C and 54 centimeters in test pit B. Test pits A and D were excavated in arbitrary 10 centimeter levels because no distinct soil horizons were encountered. The plowzone extended to a depth of 24 centimeters in test pit B and 20 centimeters in test pit C. Artifacts were recovered from below the plowzone in both test pits, indicating the presence of undisturbed cultural deposits. A stratigraphic summary of recovered cultural materials is presented in Table 20.

The site area extends across two soil types, Sharpsburg silt loam formed in loess and Morrill clay loam formed in glacial till. The plowzone found in test pits B and C was a dark brown soil. Deeper soil horizons ranged from a dark yellow brown to a dark reddish brown soil. In tests A and D no plowzone was definable and soil colors ranged from dark yellow brown to dark grayish brown. Limestone fragments were found throughout the soil strata in all four pits. Some of the limestone specimens in test pit C appear to have been exposed to high temperatures and have a red color.

TABLE 20
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0131

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	4 utilized flakes 15 interior flakes
	II	10-20 cm	sterile
	III	20-30 cm	sterile
B	I	0-24 cm	4 utilized flakes 8 interior flakes 2 secondary decortication flakes
	II	24-34 cm	3 retouched flakes 4 utilized flakes 5 interior flakes 6 secondary decortication flakes
	III	34-44 cm	4 utilized flakes 4 interior flakes 2 secondary decortication flakes
	IV	44-54 cm	1 polyhedral blade core
C	I	0-20 cm	2 interior flakes
	II	20-30 cm	1 retouched flake
	III	30-40 cm	1 retouched flake 2 interior flakes 1 secondary decortication flake
	IV	40-50 cm	1 utilized flake
D	I	0-10 cm	1 utilized flake 2 interior flakes
	II	10-20 cm	1 interior flake
	III	20-30 cm	sterile

TABLE 21
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14DO131

ARTIFACT TYPES	RAW MATERIALS				TOTAL	%
	01	07	08	10		
051	1	17	.	.	18	24.3
053	.	5	.	.	5	6.8
070	.	1	.	.	1	1.4
081	.	11	.	.	11	14.9
082	.	36	1	2	39	52.7
TOTAL	1	70	1	2	74	
%	1.4	94.6	1.4	2.7		100%

Seventy-four artifacts were recovered during the 1978 testing of this site. The artifact assemblage includes utilized flakes, a polyhedral blade core, secondary decortication flakes, interior flakes and retouched flakes. Although two pieces of debitage are made of red chert, all other artifacts are made of cherts commonly found in the Clinton Lake project, with the majority being gray chert. Artifacts and raw materials recovered from the site are summarized in Table 21.

In test pits A and D, where a plowzone was not distinguished, no artifacts were recovered below 20 centimeters. Test pit B yielded 29 artifacts below the plowzone, including utilized flakes, interior flakes, retouched flakes, secondary decortication flakes and the polyhedral blade core shown in Plate 10:C. Six artifacts, including interior flakes, retouched flakes, a utilized flake and a secondary decortication flake, were recovered from below the plowzone in test pit C.

A dark brown soil intrusion was observed at a depth of 27 centimeters in test pit C. The soil profile indicated that the intrusion extended below the base of the excavation at 50 centimeters. Although it was impossible to determine the exact nature of this intrusion, the association of the dark stain

with burnt limestone in the test pit offers support for the possible existence of a cultural feature in test pit C. The presence of artifacts below the disturbed soil horizon in test pits B and C suggests that an undisturbed cultural component is present at the site.

No culturally diagnostic artifacts were recovered from the site.

14D0132

Site 14D0132 is located 200 meters east of site 14D0131 on the edge of a broad upland ridge overlooking the Wakarusa River to the north. The site is at an elevation of between 290 and 293 meters (950 to 960 feet). A light scatter of prehistoric lithic debris was observed over the 5,000 square meter area of the site, which has estimated dimensions of 50 x 100 meters.

Six 1 x 1 meter test pits were placed within the site boundaries to ascertain the vertical extent of subsurface deposits. Tests A, B, C, D and E were randomly placed along 1976 survey transects which had produced high yields of artifacts. The sixth test, F, was placed near the site of a planned water tower where a projectile point fragment was found on the ground surface.

Like site 14D0131, this site was covered in colonizing grasses in 1976 (Iroquois Research Institute 1977), but in 1978 vegetation had been removed in preparation for construction activities. The plowzone at the site was not distinct and varied in depth from 10 to 30 centimeters. The test pits ranged in depth from 20 to 40 centimeters but no artifacts were recovered from sub-plowzone contexts. Stratigraphic summaries of materials recovered from the test excavations are presented in Table 22.

The soils at the site are Woodson silt loam and Sharpsburg silt loam. The Sharpsburg soils have differentially eroded at the site's northern edge, a fact which may account for the variability in plowzone depths found at the site. Soil colors range from dark brown topsoils to a dark reddish brown subsoil.

Only four prehistoric lithic artifacts and one historic artifact were recovered from the test excavations. Four of the designated test pits were sterile of cultural materials. Test pit D yielded three pieces of lithic debitage, one fragment in each of the three 10 centimeter levels. Test pit E yielded a utilized flake in the first 10 centimeter level and a historic metal washer in the second level, testifying to the disturbed nature of the plowzone materials. The third level was sterile. One piece of debitage found in test pit D is of brown chert while the rest of the prehistoric lithics are made of gray chert. Table 23 presents a summary of excavated artifacts recovered from the site.

In addition, one projectile point fragment was recovered from the surface of one test pit. This point, illustrated in Plate 13:A, is a basal fragment of a small, corner notched form. The fragment is made of cream colored chert and shares morphological similarities with Reed points (Bell 1958). It probably represents a Plains Woodland occupation of the site but its fragmentary nature precludes definite assignment of temporal position.

TABLE 22

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0132

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
B	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
C	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
	IV	30-35 cm	sterile
	V	35-40 cm	sterile
D	I	0-10 cm	1 interior flake
	II	10-20 cm	1 secondary decortication flake
	III	20-30 cm	1 interior flake
E	I	0-10 cm	1 utilized flake
	II	10-20 cm	1 historic metal washer
	III	20-30 cm	sterile
F	I	0-10 cm	sterile
	II	10-20 cm	sterile

TABLE 23
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14DO132

ARTIFACT TYPES	RAW MATERIALS		TOTAL	%
	04	07		
051	.	1	1	25
081	.	1	1	25
082	1	1	2	50
TOTAL	1	3	4	
%	25	75		100%

14DO133

Site 14DO133 is located on the summit of a spur overlooking the Wakarusa River and is at an elevation of 290 meters (950 feet). The site is in the Upland Prairie Ecological Zone and is presently covered by mixed herbaceous vegetation. Surface collection data from the 1976 survey (Iroquois Research Institute 1977) indicated that the northwestern tip of the spur would yield additional data relative to cultural position and the horizontal and vertical extent of the site. The site covers an area of 13,125 square meters with estimated dimensions of 75 x 175 meters.

Three 1 x 1 meter test pits were excavated at the site. Test pits A and B were randomly placed on high density survey transects defined by the 1976 survey, and pit C was selectively placed in the area of highest observed artifact concentration. Test A was the most deeply excavated pit, reaching a depth of 37 centimeters. A single interior flake was recovered in the zero to 17 centimeter level, the plowzone, while the lower strata were sterile. Test pit B was excavated to a depth of 30 centimeters and was culturally sterile. Test pit C yielded nine artifacts in the zero to 12 centimeter level and three interior flakes in the second level, from 12 to 22 centimeters. No plowzone was apparent in either test pit B or test pit C.

Site 14DO133 is located on Morrill clay loam soil. The soil at the site has undergone severe erosion which appears to have been accelerated in part by

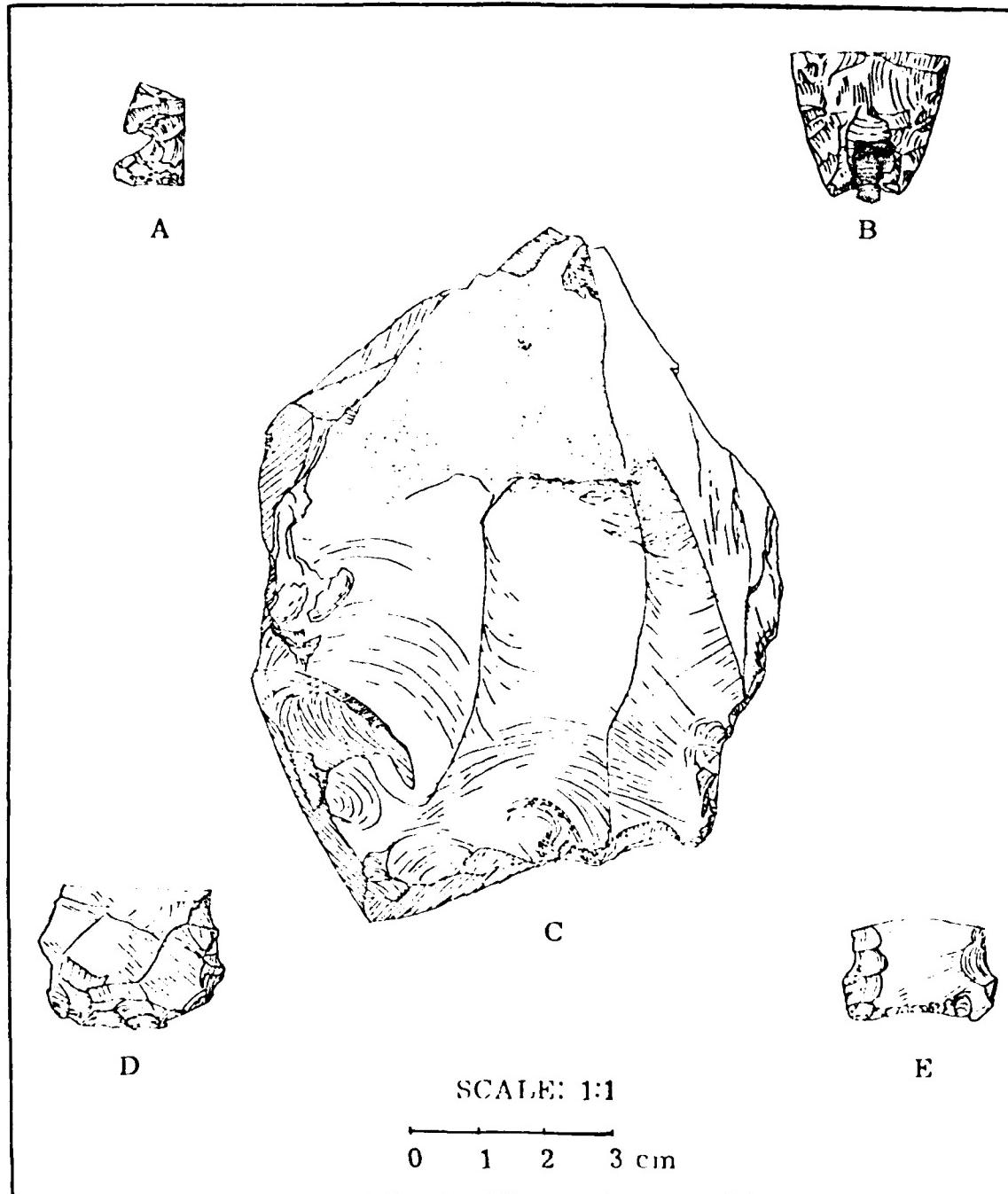


PLATE 13

Chipped Stone Artifacts from 14D0132, 14D0133 and 14D0135. (A) Small, corner notched point fragment from 14D0132. (B) Lanceolate point base from 14D0133. (C) Core from 14D0135. (D) Biface fragment from 14D0135. (E) Point base from 14D0135.

TABLE 24

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0133

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-17 cm	1 interior flake
	II	17-27 cm	sterile
	III	27-37 cm	sterile
B	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
C	I	0-12 cm	1 biface fragment 3 utilized flakes 1 retouched flake 4 interior flakes
	II	12-22 cm	3 interior flakes

historic period cultivation practices. The erosion may account for the shallow depth of cultural deposits and the lack of distinct soil horizons at the site. The maximum depth of artifact recovery was 22 centimeters. A stratigraphic summary of excavated prehistoric materials is presented in Table 24.

The artifacts recovered from test excavations include a biface fragment, three utilized flakes, one retouched flake and eight pieces of debitage. In addition, a biface fragment, illustrated in Plate 13:B, was recovered from the ground surface of test pit C. This specimen appears to be the basal portion of a lanceolate projectile point with a tapered hafting area and an incurvate base. Retouching and grinding are present on both lateral edges but not on the basal edge. A small channel flake was removed from one side of the artifact. The item is too incomplete to allow definite typological identification, but it is similar to a number of Middle and Late Archaic styles reported from western

TABLE 25

INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14DO133

ARTIFACT TYPES	RAW MATERIALS			TOTAL	%
	01	07	08		
028	.	1	.	1	7.7
051	.	2	1	3	23.1
053	.	.	1	1	7.7
082	1	6	1	8	61.5
TOTAL	1	9	3	13	
%	7.7	69.2	23.1		100%

Missouri (Chapman 1975). It is made of a pinkish brown fossiliferous chert which resembles locally available materials. The other artifacts recovered at the site are primarily made of gray and pink cherts. Half of the materials contain small, white fossiliferous inclusions. Table 25 presents the artifacts and raw materials in the assemblage.

14DO134

This site, along with 14DO135, 14DO136, 14DO149 and 14DO150, is situated on the edge of the Upland Prairie about 10.6 meters (35 feet) above the adjacent Deer Creek floodplain. It is within roughly 350 meters of these four other sites. On a northwest lobe of the bench and at a total elevation of 277 to 280 meters (910 to 920 feet), site 14DO134 overlooks the confluence of Dry Creek and Deer Creek. During the 1976 survey a fairly dense surface scatter of lithic materials was observed at the site, whose dimensions were estimated to be 125 x 200 meters, for a total area of 25,000 square meters (Iroquois Research Institute 1977). Testing in 1978 revealed the presence of a historic component as well as a prehistoric component.

Four 1 x 1 meter test pits were excavated to determine the horizontal and vertical extent of the site. A, B and C were randomly placed along high density

TABLE 26

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0134

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-25 cm	2 utilized flakes 2 interior flakes
	II	25-35 cm	7 interior flakes
	III	35-45 cm	1 interior flake
B	I	0-20 cm	40 historic artifacts 1 retouched flake 3 utilized flakes 11 interior flakes 8 mussel shells
	II	20-30 cm	1 historic artifact
C	I	0-10 cm	1 historic artifact 1 interior flake
	II	10-20 cm	1 retouched flake 2 utilized flakes
	III	20-30 cm	1 historic artifact
D	I	0-26 cm	3 historic artifacts 1 projectile point tip 4 retouched flakes 21 utilized flakes 48 interior flakes 5 secondary decortication flakes
	II	26-36 cm	5 interior flakes
	III	36-46 cm	sterile

1976 survey transects. The fourth test, D, was placed in the middle of the three tests to verify a continuous scatter of artifacts. Excavated depths ranged from 30 to 46 centimeters. A plowzone was evident in all four tests and ranged in depth from 20 to 26 centimeters. Cultural materials were recovered below this zone in each of the four test pits. A stratigraphic summary of recovered artifacts is presented in Table 26.

The bench which this site occupies has scattered, glacially derived quartzite cobbles, stream worn cherts and angular fragments of local limestone on its surface. The well drained Oska silty clay loam at this site has a depth of up to one meter to limestone bedrock. The site area has been cultivated, and the occurrence of historic artifacts below the plowzone indicates that the soil has been disturbed. The plowzone ranges in color from dark brown to dark reddish brown. The deeper soil horizons range from a dark yellowish brown to a dark brown color. Limestone bedrock was encountered in three of the four tests. The mixture of rock types, the kinds of soils and the microrelief of the bench indicate that glacial activity probably shaped the bench and left a considerably deeper deposit of glacio-fluvial sediments than is now present, most having been eroded by wind and water (O'Conner 1960).

A total of 115 prehistoric artifacts, summarized in Table 27, and 46 historic artifacts were recovered from the testing of site 14D0134. The prehistoric artifact assemblage includes the distal portion of a projectile

TABLE 27
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0134

ARTIFACT TYPES	RAW MATERIALS						TOTAL	%
	01	04	07	08	12	13		
003	.	.	.	.	.	1	1	0.9
051	8	.	2	4	14	.	28	24.3
053	1	.	.	4	1	.	6	5.2
081	.	.	.	.	5	.	5	4.3
082	29	1	8	20	16	1	75	65.2
TOTAL	38	1	10	28	36	2	115	
%	33.0	0.9	8.7	24.3	31.3	1.7		100%

point, utilized flakes, retouched flakes, secondary decortication flakes and interior flakes. Most of the artifacts are debitage, with interior flakes being the most predominant artifact type. During the 1976 survey, similar types of artifacts were recovered, in addition to a quartzite hammerstone (Iroquois Research Institute 1977). No diagnostic prehistoric artifacts or features were identified at this site. The projectile point recovered in 1978 is too fragmentary to identify with an established type.

The most commonly occurring chert colors in the assemblage are beige, tan and pink. Two rarely occurring white chert artifacts were also recovered.

The historic assemblage includes nail fragments, glass, miscellaneous metal objects, and earthenware ceramics. Although no structural features were found and no structure is indicated on the 1958 U.S. Army Corps of Engineers baseline map or the 1970 topographic map, the historic artifact assemblage suggests the previous existence of a structure and historic occupation at this location.

Eight mussel shells were recovered from the plowzone of test pit B. Mussel shells could not have been naturally deposited in the site area. This suggests that they were utilized as local resources during the prehistoric or historic periods.

14D0135

This site is southeast of site 14D0134 on the edge of an Upland Prairie segment. At an elevation of 283 to 287 meters (930 to 940 feet), the site area is 12 meters (40 feet) above and overlooks the floodplain of Deer Creek to the northeast. A portion of the site has been cultivated during the historic period while the remainder lies within a wooded area.

Large amounts of lithic tools and debitage were collected from the surface of the site during the 1976 survey, and site dimensions were estimated to be 300 x 100 meters, for an area of approximately 30,000 square meters. Diagnostic artifacts recovered from the surface indicated that the site might be associated with a Woodland occupation (Iroquois Research Institute 1977). In the 1978 field season, eight test pits were excavated to investigate the provisional Woodland Period affiliation and to determine the vertical and horizontal extent of the site. Selective surface collections were also conducted during the 1978 field investigation.

Of the eight 1 x 1 meter tests conducted at this site, A, B, C, D, E and F were randomly placed along transects employed in the 1976 survey. Test pit G was placed at the northern periphery of the site while test pit H was placed along the eastern periphery. Excavated depths varied between 30 and 50 centimeters. Only four of the eight tests exhibited a plowzone in their soil profiles. In those tests, A, C, D and F, the depth of the cultivated zone varied between 20 and 30 centimeters. Tests A, C and D yielded artifacts below the plowzone, the deepest deposit being found at 40 to 50 centimeters in test pit A. At a depth of between 23 and 27 centimeters in test pit A, a small concentration of charcoal was observed. Although it did not appear to be a

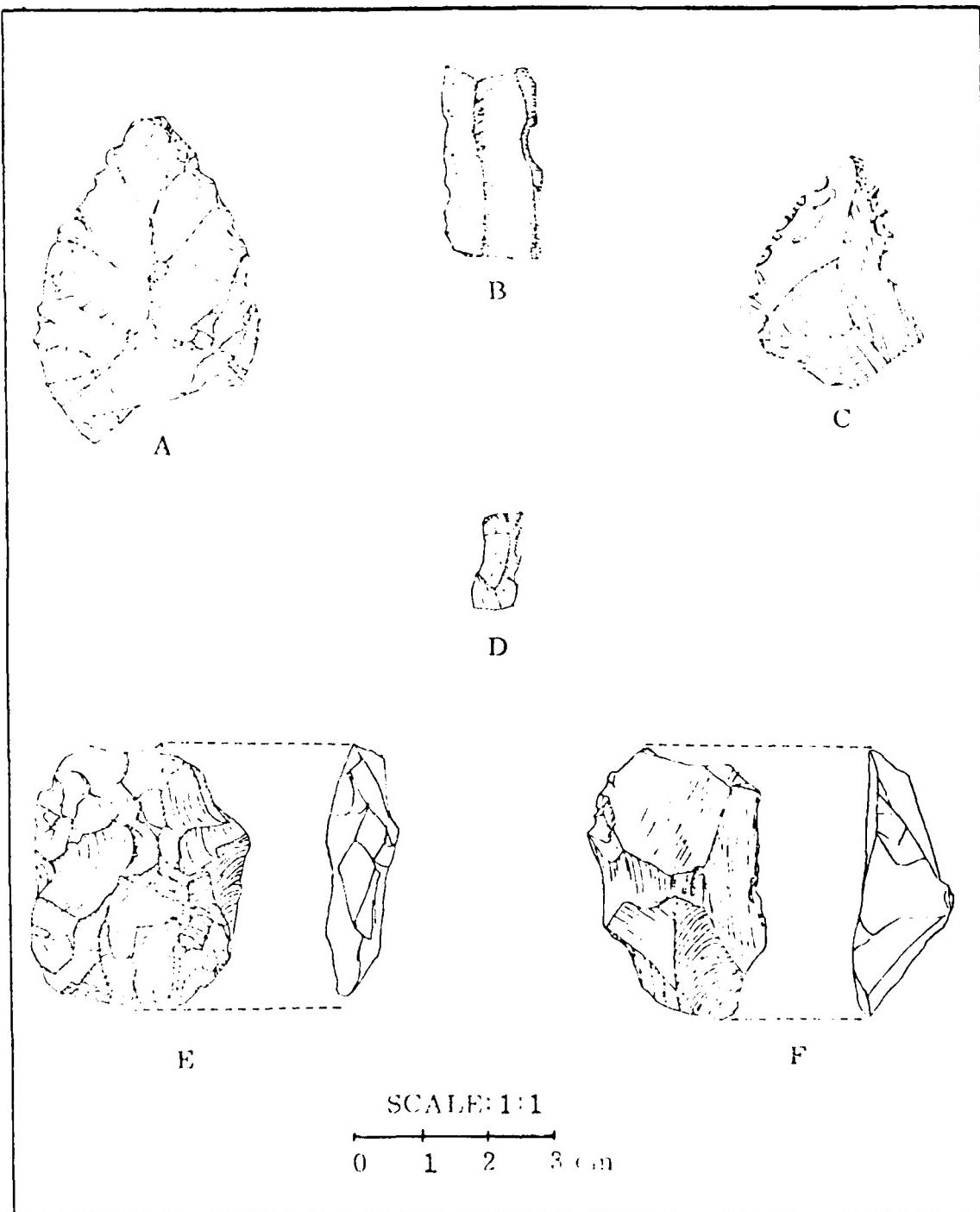


PLATE 14

Chipped Stone Artifacts from 14D0135, 14D0137 and 14D0140. (A) Biface from 14D0135.
 (B) Spokeshave from 14D0137. (C) Flake tool from 14D0137. (D) Microblade from 14D0137.
 (E) Biface from 14D0137. (F) Core from 14D0140.

feature, the charcoal may represent the remnants of a fire hearth. Table 28 contains stratigraphic summaries of the materials recovered from the excavations.

The Woodson silt loam soil at the site has formed in fine textured, glacio-fluvial sediments; it is somewhat poorly drained and moderately eroded. Part of the site area has been recently cultivated and is presently an open field covered with mixed herbaceous vegetation; the rest is lightly wooded and may have been cultivated at some time during the historic period. The highest artifact recovery rate occurred on the northern edge of the site along the wooded terrace edge. Throughout the site, the upper 30 centimeters of soil exhibited a very dark grayish brown to dark brown color. The subsoil horizon varied in color from dark reddish brown to dark yellowish brown.

A total of 181 prehistoric artifacts were recovered from excavation at 14D0135. The excavated assemblage includes bifaces, one of which is illustrated in Plate 14:A, a core shown in Plate 13:C, utilized flakes, a primary decortication flake, secondary decortication flakes and interior flakes. Also, a projectile point fragment, biface fragments, modified flakes and a large interior flake were collected from the surface of the site. The projectile point fragment made of tan chert is fractured just above the hafting area. Plano-convex in cross section, the point exhibits a rounded, expanding stem and a concave base. The fragmentary nature of the point precludes its identification with a known point type. This artifact is illustrated in Plate 13:E.

The most common colors of chert in the excavated assemblage are gray, tan, pink and beige, as can be seen in Table 29. Most of these materials are probably of local origin. However, six pieces of rare white chert, which may be non-local, were also recovered at this site.

A small point stylistically similar to the Bonham type (Marshall 1972) was collected in 1976 (Iroquois Research Institute 1977). This item has been affiliated with the Plains Woodland Period in southeastern Kansas (Marshall 1972).

14D0137

This site is on a broad, nearly level ridgeline, or cuesta, at an elevation of 311 to 314 meters (1,020 to 1,030 feet) above mean sea level. To the southeast of the site the base of the cuesta is abutted abruptly by the floodplain of the Wakarusa River, but to the east and north there is an intermediate, level bench bordering the base of the cuesta and Deer Creek. Thus, the site is at a considerable height above the valley floor, and it is more distant from an available water source than any of the other prehistoric sites in the project area. Its dimensions have been estimated to be approximately 100 x 300 meters, for a total area of 30,000 square meters.

Surficial examination of the site area in 1976 (Iroquois Research Institute 1977) yielded the proximal end of a concave based projectile point of a generalized Clovis type, shown in Plate 15. This specimen exhibits multiple

TABLE 28

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0135

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	2 utilized flakes
	II	10-20 cm	2 interior flakes
	III	20-30 cm	1 interior flake
	IV	30-40 cm	2 interior flakes
	V	40-50 cm	1 utilized flake 2 interior flakes
B	I	0-10 cm	2 utilized flakes 9 interior flakes
	II	10-20 cm	sterile
	III	20-30 cm	sterile
C	I	0-20 cm	1 core 14 interior flakes 3 utilized flakes
	II	20-30 cm	1 interior flake
	III	30-40 cm	sterile
	IV	40-50 cm	sterile
D	I	0-10 cm	1 utilized flake
	II	10-20 cm	1 interior flake
	III	20-30 cm	1 utilized flake 9 interior flakes
	IV	30-40 cm	sterile

TABLE 28 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0135

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
E	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
F	I	0-10 cm	1 utilized flake 1 secondary decortication flake 1 interior flake
	II	10-20 cm	4 interior flakes
	III	20-30 cm	sterile
	IV	30-40 cm	sterile
G	I	0-10 cm	3 bifaces 38 interior flakes 3 secondary decortication flakes 1 utilized flake
	II	10-20 cm	18 interior flakes 1 utilized flake
	III	20-30 cm	2 interior flakes
H	I	0-10 cm	2 utilized flakes 13 interior flakes 1 primary decortication flake
	II	10-20 cm	33 interior flakes
	III	20-30 cm	5 interior flakes 1 secondary decortication flake
	IV	30-35 cm	1 interior flake

TABLE 29

INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14DO135

ARTIFACT TYPES	RAW MATERIALS							TOTAL	%
	01	04	07	08	10	12	13		
026	.	1	2	.	.	.	.	3	1.7
051	3	2	6	4	.	.	.	15	8.2
077	.	.	.	.	.	1	.	1	0.5
080	.	.	.	.	1	.	.	1	0.5
081	1	.	2	.	.	2	.	5	2.8
082	26	3	44	24	2	51	6	156	86.1
TOTAL	30	6	54	28	3	54	6	181	
%	16.6	3.3	29.8	15.5	1.7	29.8	3.3		100%

flutes on one face, a single flute on the other face and basal grinding. In view of the possibility that 14DO137 may represent a Paleo-Indian occupation, subsurface testing of the site was recommended. Upon the return to the site in 1978, additional surface examinations were conducted to delineate the areas of highest artifact concentration. Seven 1 x 1 meter excavation units were located within the site area to determine the horizontal and vertical extent of the cultural occupation and to confirm the presence of a Paleo-Indian component.

Initially, three excavation units, A, B and C, were randomly placed along high density transects that were utilized during the 1976 survey effort. These three tests did not yield the anticipated quantity and variety of artifacts, so a surface examination of the site was conducted. This revealed an area of high artifact concentration west of the initial excavation. Four additional excavation units, D E, F and G, were placed within this area of high artifact concentration.

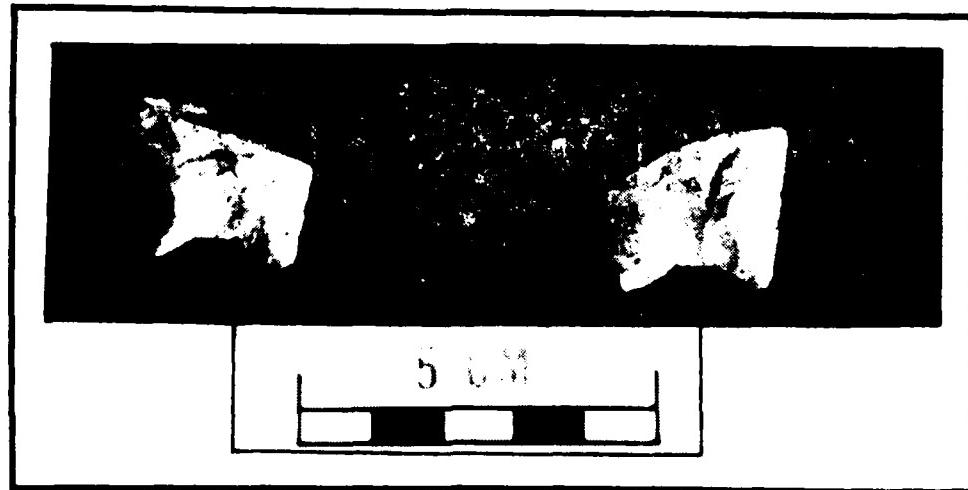


PLATE 15
Clovis-like Point Base Found at 14DO137 during the 1976 Survey.

The depths of the test excavations ranged from 24 to 70 centimeters. Portions of the site have been previously cultivated and a plowzone was evident in test pits A, B, C, F and G. This stratum varied between 12 and 30 centimeters in depth. Cultural materials were recovered from below the plowzone in each of these tests. This suggests that undisturbed cultural deposits are present at the site. A stratigraphic summary of excavation is presented in Table 30.

The soil surface and matrix contain considerable quantities of angular field chert fragments which were often difficult to distinguish from chert artifacts. The field chert is likely to have been derived from the Lecompton Limestone Formation, the locally outcropping bedrock which has weathered in situ to form the soil's parent material. The Martin-Oska silty clay loam soil complex occupying the site is moderately well drained and has been slightly eroded as a result of historic period cultivation. At the time of investigation, the site area was covered with grasses and underbrush. The plowzone is a hard, dense, very dark grayish brown soil. Lower soil horizons consist of dark brown to dark yellowish brown compacted soil. A majority of the tests revealed the presence of root intrusions and animal burrow remnants.

A total of 417 prehistoric artifacts were recovered from the test excavations at site 14DO137. The artifact assemblage includes side scrapers, utilized flakes, retouched flakes and a microblade. The microblade is illustrated in Plate 14:D. Over 92% of the recovered materials consists of lithic debitage, including primary decortication flakes, secondary decortication flakes, interior flakes and other debitage. The majority of the materials utilized are common pink, gray and tan cherts, as shown in Table 31.

TABLE 30

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0137

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-14 cm	1 interior flake
	II	14-24 cm	2debitage
B	I	0-20 cm	4debitage 1 unmodified turtle shell
	II	20-30 cm	1 utilized flake 12debitage 4interior flakes 3secondary decortication flakes
C	III	30-40 cm	2debitage
	IV	40-50 cm	3debitage
	V	50-60 cm	1utilized flake 12debitage 2primary decortication flakes
	VI	60-70 cm	6debitage 1primary decortication flake
	I	0-23 cm	1utilized flake 4debitage 7interior flakes 1primary decortication flake
C	II	23-33 cm	4debitage 1interior flake 1primary decortication flake
	III	33-43 cm	1debitage 2interior flakes
	IV	43-53 cm	1debitage
	V	53-63	sterile

TABLE 30 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0137

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
D	I	0-10 cm	1 utilized flake 1 debitage 1 interior flake 12 primary decortication flakes
	II	10-20 cm	1 debitage 1 primary decortication flake
	III	20-30 cm	1 primary decortication flake
E	I	0-10 cm	5 debitage 9 interior flakes 1 primary decortication flake
	II	10-20 cm	1 flake side scraper 7 debitage 7 interior flakes
	III	20-30 cm	5 interior flakes 1 debitage
	IV	30-40 cm	2 debitage 1 secondary decortication flake
	V	40-50 cm	5 debitage 3 interior flakes
	VI	50-60 cm	sterile
F	I	0-10 cm	1 flake side scraper 2 retouched flakes 10 utilized flakes 41 debitage 37 interior flakes 5 secondary decortication flakes 12 primary decortication flakes

TABLE 30 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0137

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
F	II	10-20 cm	1 microblade 2 retouched flakes 4 utilized flakes 22 debitage 28 interior flakes 4 secondary decortication flakes 1 primary decortication flake
	III	20-30 cm	1 unifacial end and side scraper 1 retouched flake 1 utilized flake 8 debitage 5 interior flakes 1 primary decortication flake
	IV	30-40 cm	8 debitage 2 interior flakes
	V	40-50 cm	5 debitage 3 interior flakes
	VI	50-55 cm	2 utilized flakes 1 interior flake
	I	0-10 cm	2 utilized flakes 19 debitage 11 interior flakes 1 secondary decortication flake
G	II	10-20 cm	1 utilized flake 25 interior flakes 1 secondary decortication flake
	III	20-30 cm	1 interior flake
	IV	30-40 cm	2 interior flakes 1 secondary decortication flake
	V	40-50 cm	2 debitage 1 interior flake
	VI	50-60 cm	sterile

TABLE 31
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0137

ARTIFAC. TYPE	RAW MATERIALS										TOTAL	%
	01	04	06	07	08	09	10	12	14	15		
0+7	1	.	.	1	.	.	.	.	.	.	1	0.5
051	1	.	6	7	2	.	.	8	.	.	24	5.8
053	.	.	.	3	.	.	.	2	.	.	5	1.2
066	.	.	.	.	.	.	.	1	.	.	1	0.2
080	.	1	3	23	2	.	1	4	.	.	34	8.2
081	.	1	1	5	1	.	.	8	.	.	16	3.8
082	19	1	3	59	24	8	5	37	.	.	156	37.5
086	24	15	23	35	32	.	9	37	3	.	178	42.8
TOTAL	45	18	36	133	61	8	15	97	3	.	416	
%	10.8	4.3	8.7	32.0	14.7	1.9	3.6	23.3	0.7	.		100.

In addition, 17 prehistoric artifacts were collected from the surface of the site, including a biface, a biface fragment, utilized and modified flakes, a core fragment, a secondary decortication flake, interior flakes and otherdebitage. The biface is illustrated in Plate 14:E.

No culturally diagnostic artifacts were recovered in the 1978 season, so the occurrence of a Paleo-Indian component at this site cannot be supported by data other than the single projectile point fragment recovered in 1976. Other artifacts collected in 1976 include scrapers, cores, bifaces, modified flakes and a large amount of lithic debitage (Ibid.).

14D0140

Site 14D0140 is located on a narrow ridge spur between Coon Creek and an unnamed intermittent tributary stream. The site occupies the ridge spur extending southeast to the bank of the intermittent stream, at an elevation of between 277 and 280 meters (910 to 920 feet). It was partially in cultivation on its lower slopes and terrace at the time of the 1978 investigations. The remainder of the site was covered in cactus, succulents and grasses, and is not suitable for agricultural activities due to the presence of chert and limestone outcrops. The estimated size of the site is 150 x 75 meters. The site covers an area of approximately 11,250 square meters.

Four test excavations were randomly placed on 1976 survey transects that were subsequently determined to be downslope from the site. This area is closer to the intermittent stream than to the center of the site, which is 95 meters north of the stream bed. The four randomly placed tests resulted in sterile excavations, as indicated in the stratigraphic summaries of tests A, B, D and F included in Table 32.

In view of these results, three pits were excavated on the higher ground about 50 to 75 meters north of the initial tests and closer to the apparent center of the site. This placed the tests in an area of rather thin, discontinuous soil as indicated by tests G, H and I, which all encountered shallow bedrock. Test G was the deepest of all tests conducted on the terrace and was halted at bedrock at a depth of 40 centimeters. Tests H and I were excavated to depths of only 23 and 35 centimeters respectively because bedrock was reached. Artifacts were recovered from all levels of these three tests except the lowermost level of test I. No cultural features were encountered during the excavation of the seven test pits at this site.

The lower portion of the site has been cultivated to a depth of at least 30 centimeters and soils have been somewhat eroded. The higher portion seems to have remained relatively undisturbed by erosion and, due to its unsuitability for cultivation, has been unaffected by agriculture.

The narrow spur the site straddles is in an area classified as Stony steep land, with thin and discontinuous soil which has been described by excavators as silty clay loam or clay loam formed from a mixture of glacial, loessial and weathered *in situ* deposits. This portion of the site contains a considerable amount of field chert, primarily a weathered and coarse textured type of tan to beige, with variants of red and brown. These specimens usually exhibit finely mottled, dark or light fossiliferous inclusions with occasional thin veins of translucent chalcedony. The tan cherts do not appear to be of exceptional working quality. They are similar to materials found at 14D0309, 2.2 kilometers to the southeast. These chert deposits appear to be quite localized in occurrence, as test H yielded a finer grained, fossiliferous gray chert of the variety which is common in the Clinton Lake area. This chert possessed better working qualities than the coarser grained, tan chert.

The artifact assemblage recovered from test excavations at site 14D0140 is summarized in Table 33. The assemblage is limited to lithic artifacts and includes a preform, large biface fragments, spokeshaves, unmodified blades, cores, retouched flakes, utilized flakes, quarry waste and debitage. Some of the cores, spokeshaves and utilized flakes are shown in Plates 14:F; 16; 17:A, B and D; and 18:A, C and D. Common tan and gray cherts comprise 69.6% of the artifact assemblage. No culturally diagnostic artifacts were recovered at this site.

14D0144

Site 14D0144 is located at an elevation between 262 and 265 meters (860 to 870 feet) above sea level on a low rise on the left bank or west side of the Wakarusa River. On the basis of subsurface testing and surface observations,

TABLE 32

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14DO140

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
B	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
D	I	0-10 cm	sterile.
	II	10-20 cm	sterile
	III	20-30 cm	sterile
F	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
G	I	0-10 cm	2 spokeshaves 1 preform 1 core 7 utilized flakes 16 interior flakes 23 quarry waste
	II	10-20 cm	1 core 23 interior flakes 13 quarry waste
	III	20-30 cm	4 utilized flakes 6 interior flakes 19 quarry waste

TABLE 32 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0140

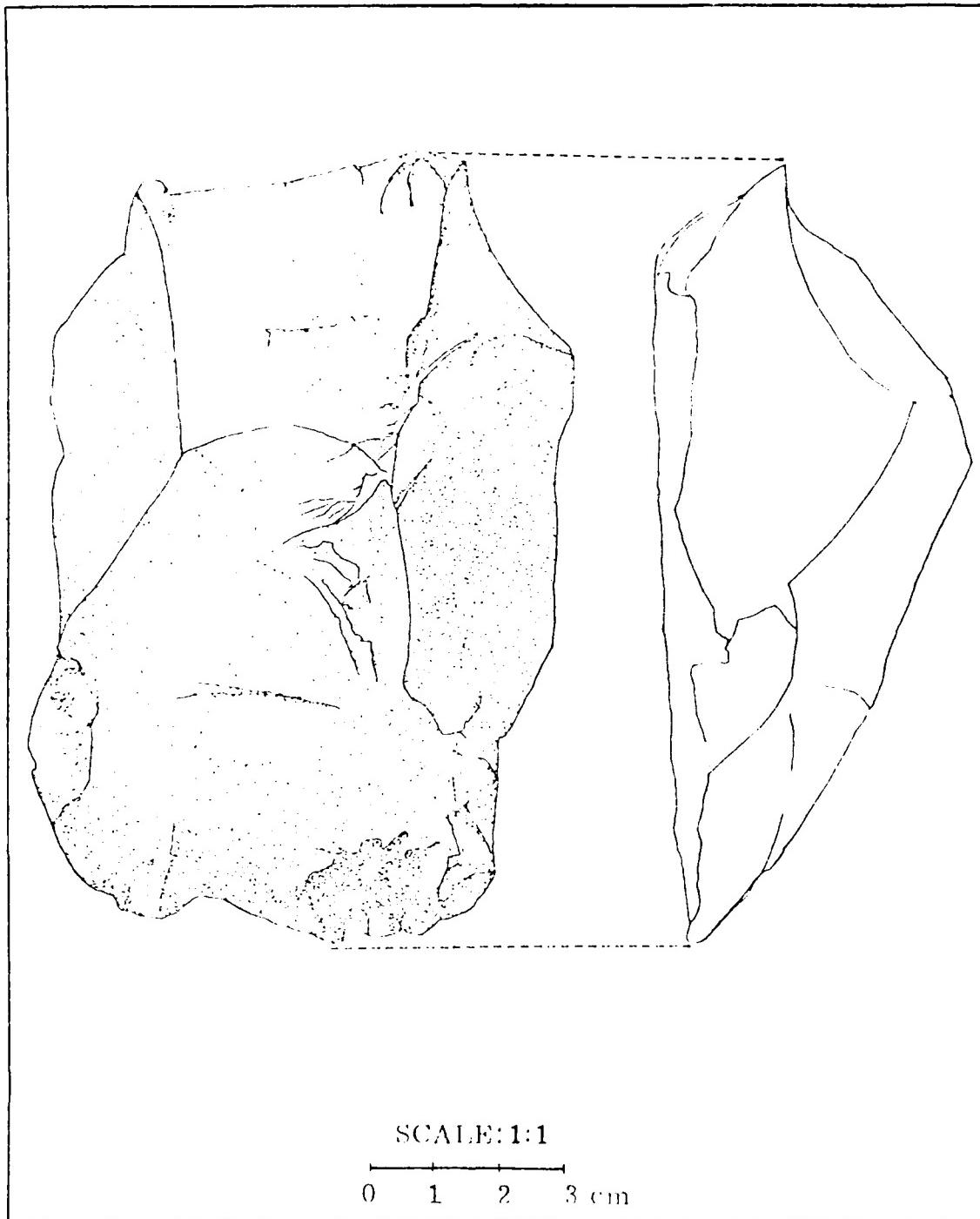
TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
G	IV	30-40 cm	15 interior flakes 1 unmodified blade 5 quarry waste
H	I	0-13 cm	4 utilized flakes 21 interior flakes 43 quarry waste 3 secondary decortication flakes
	II	13-23 cm	7 retouched flakes 19 utilized flakes 67 interior flakes 53 quarry waste 14 secondary decortication flakes
I	I	0-10 cm	1 historic artifact 3 unmodified turtle shell pieces 1 discoidal core 3 cores 2 retouched flakes 21 utilized flakes 26 interior flakes 4 secondary decortication flakes
	II	10-20 cm	2 large bifaces 10 retouched flakes 31 utilized flakes 1 unmodified blade 1 exhausted core 1 core 109 interior flakes 17 quarry waste 25 secondary decortication flakes 2 primary decortication flakes
	III	20-30 cm	4 utilized flakes 25 interior flakes
	IV	30-35 cm	sterile

TABLE 33

INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0140

ARTIFACT TYPES	RAW MATERIALS						TOTAL	%
	01	04	07	08	10	12		
010	.	1	.	.	.	.	1	0.2
026	.	.	.	.	.	2	2	0.3
043	.	2	.	.	.	.	2	0.3
051	9	11	17	.	.	53	90	13.8
053	6	.	1	1	.	11	19	2.9
060	.	1	.	.	.	1	2	0.3
073	.	.	.	.	.	1	1	0.2
074	39	42	75	.	1	16	173	26.5
075	.	.	.	.	.	1	1	0.2
077	1	.	.	.	.	5	6	0.9
080	.	.	.	.	.	2	2	0.3
081	1	.	17	.	.	28	46	7.0
082	38	25	75	18	2	150	308	47.2
TOTAL	94	82	185	19	3	270	653	
%	14.4	12.6	28.3	2.9	0.5	41.3		100%

the site is estimated to cover approximately 15,000 square meters with approximate dimensions of 100 x 150 meters. The eastern edge of the site is defined by the river bank although extensive erosion of archaeological deposits



SCALE: 1:1
0 1 2 3 cm

PLATE 16

Cone from Site 1400140.

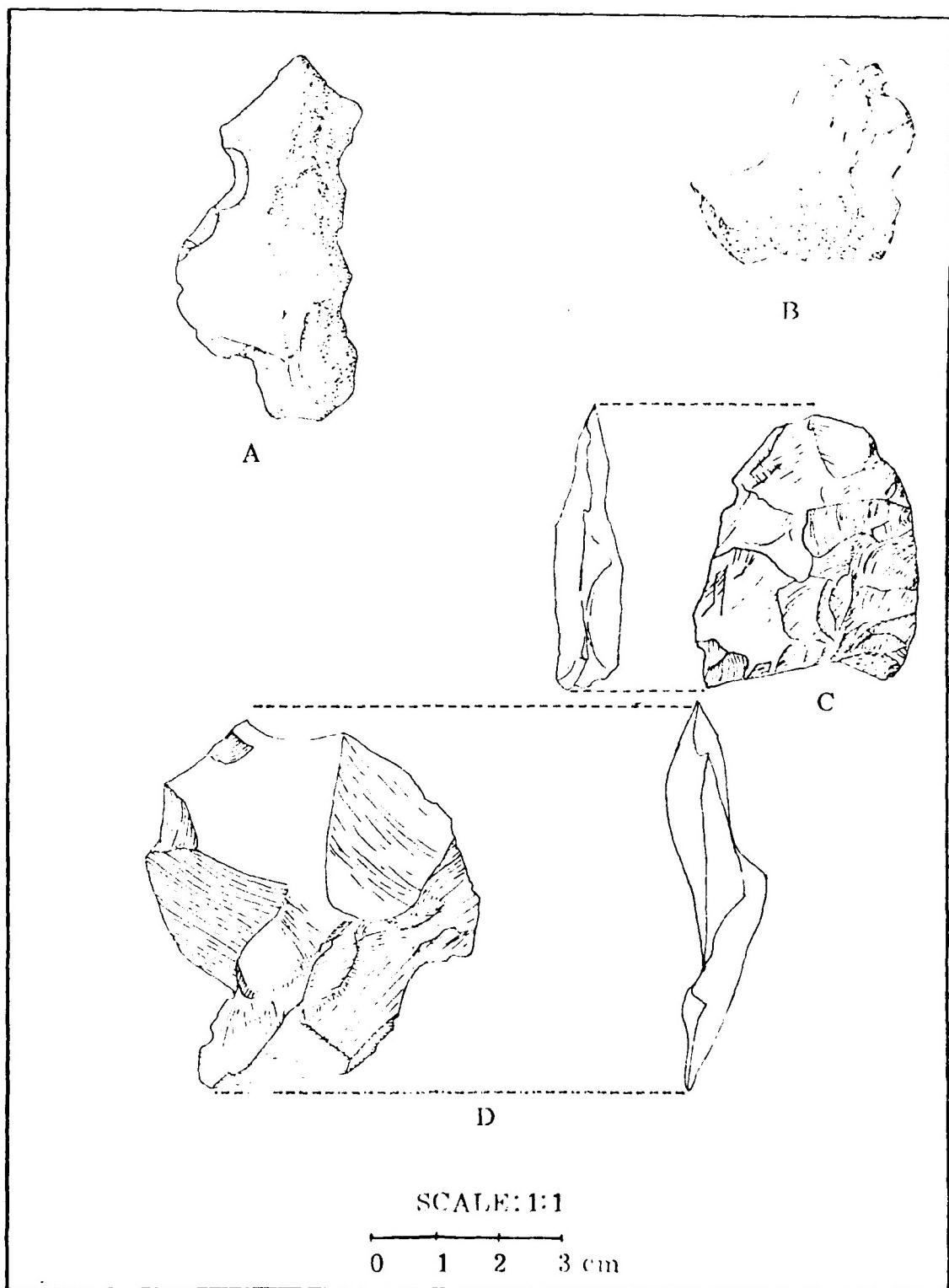


PLATE 17

Chipped Stone Artifacts from 14B2140. (A) Sickle-like. (B) Spokeshave. (C) Bi-facial fragment. (D) Spokeshave.

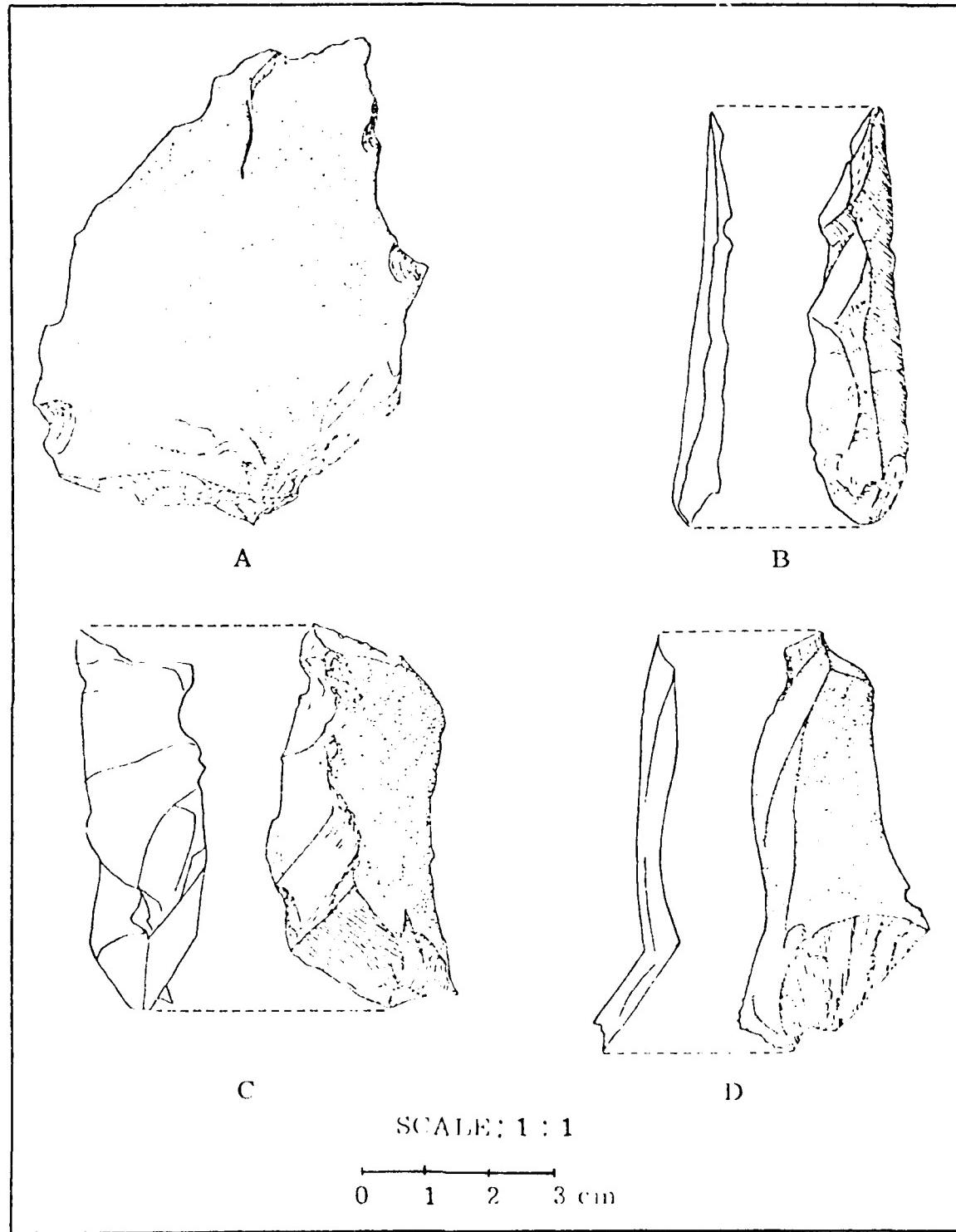


PLATE 18

Chipped Stone Artifacts from 1400140. (A) Utilized flake. (B) Unmodified flake.
(C) Utilized flake. (D) Utilized flake.

does not appear to have occurred. This was the only site on the Wakarusa floodplain investigated during the 1978 field season, and it is the locus of a study of the effects of inundation, as described in Appendix C.

Seven 1 x 1 meter test pits were excavated at the site. Tests A and B were placed at random distances along high density 1976 survey transects. Tests F and G were placed in areas of the site where it was believed that high artifact densities occurred. Tests C, D and E were placed on radii extending from the presumed center of the site. Except for some plowzone levels, all of the test pits were excavated in arbitrary 10 centimeter levels.

Test A reached a depth of 184 centimeters and artifacts were found in the lower 90 centimeters of the pit. This test yielded the deepest materials recovered during the 1978 investigation in the project area. Test B was excavated to a depth of 130 centimeters but no artifacts were found below 30 centimeters. In test C, artifacts were recovered to 50 centimeters, a sterile layer was found between 50 and 90 centimeters, and artifacts were again recovered from the 90 to 100 centimeter level.

Test D was excavated to a depth of 173 centimeters. Artifacts were found to a maximum depth of 53 centimeters. Further excavation below 53 centimeters in test pit D did not uncover artifacts, but at 79 centimeters a large bone, which is shown in Plate 19, was discovered. The bone has been identified (Martin, personal communication) as a cervical vertebra of a buffalo, Bison bison. The large size of the bone suggests that it belonged to an animal that lived between 2,000 and 3,000 years ago (Ibid.). At present, the deposition agent of the bone at the site is unknown. No artifacts were found with the bone nor were butchering marks in evidence.

During laboratory analysis, it was found that this bone was extremely friable. It was therefore stabilized with a solution of Elmer's glue and water. Prior to submission of the vertebra to Geochron Laboratories, Cambridge, Massachusetts, for radiocarbon determinations, it was determined by Geochron personnel that it would be possible to obtain an accurate age determination in spite of the stabilization treatment. However, two samples from this bone were run with unsuccessful results. An analysis of the bone apatite yielded a recent age of less than 200 years B.P. (GX-6489-A), doubtlessly as a result of the stabilization treatment (Krueger 1980). An additional gelatin fraction from the residue of the apatite dissolution was analyzed (GX-6489-G), but this sample was too small for dating purposes (Ibid.).

Test pit E yielded artifacts from the upper 30 centimeters of excavation. Eight additional 10 centimeter levels were excavated but no artifacts were found. However, charcoal was noted in the 50 to 60 centimeter level, and 10 bulrush, Scirpus sp., seeds were recovered during water screening of soil samples taken from the 50 to 60 centimeter level as well. Bulrushes are common to floodplain environments, and without associated artifacts it cannot be determined if the deposition of these seeds at the site was due to natural events or human activities.

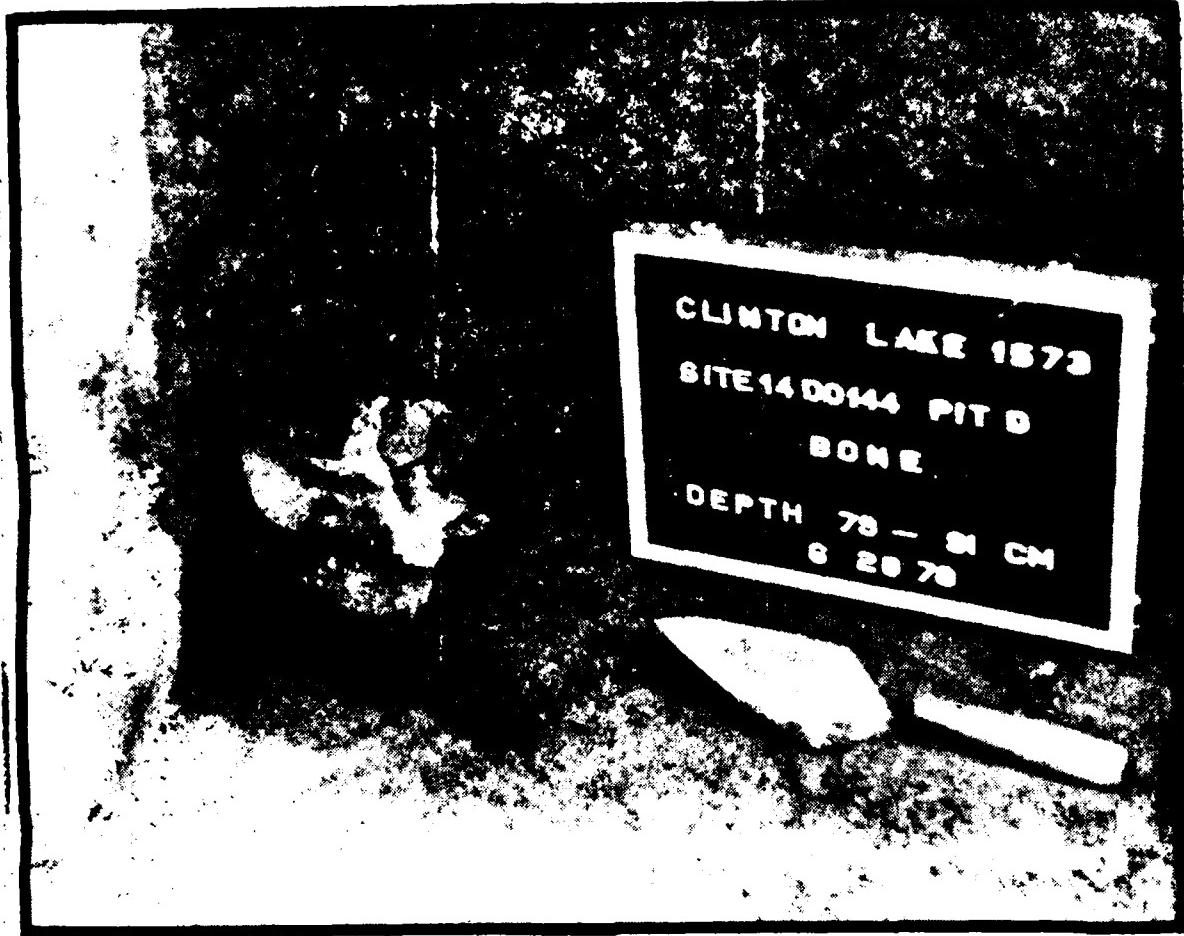


PLATE 19

Bison Vertebra Recovered From Site 14D0144. The second cervical vertebra, axis, from a plains bison, *Bison bison*, was encountered at a depth of 79 to 81 centimeters. No cultural indicators were found in association with the bone; however, cultural remains were recovered from the preceding levels of the test pit. The bone was fairly well preserved owing to its relative depth and the acidity of the soil being a neutral pH 7. The plains bison first made its appearance on the earth thousands of years ago and small herds are still found in a natural state in Colorado and Alaska.

Test F was excavated to a depth of only 20 centimeters and a mixture of historic and prehistoric artifacts was found in both levels. Test G was excavated to a 60 centimeter depth. Historic and prehistoric artifacts appeared in the upper 30 centimeters of this test pit and prehistoric artifacts continued to a depth of 50 centimeters.

The stratigraphic summaries for the test excavations at site 14D0144 are presented in Table 34. No evidence of cultural features was found at the site. In 1978 several artifacts, including diagnostic points, biface fragments, utilized flakes, a utilized blade and a bifacial end scraper, were recovered from the surface of the site.

Site 14D0144 is located on Kennebec and Reading silt loams with the Reading soil occurring on the higher elevations of the site. These deep soils are moderately well to well drained and display little soil profile development due to their alluvial nature and relative youth.

Test pits A, B and C displayed dark colored soil profiles ranging from brown to black. Soils in these pits became darker with depth rather than lighter, contrary to what is usually found in a developed soil profile. The areas of these test excavations have probably experienced rapid deposition in the recent past.

Tests D, E and G had profiles which indicated some soil development. These pits displayed soil colors becoming lighter with depth and were culturally sterile below 50 centimeters.

Two sherds, two scrapers, a piece of fire cracked rock, utilized flakes, debitage, and bifaces, some of which are projectile point fragments, were recovered from the surface of the site during the 1978 testing program. The sherds are shown in Plate 20:F and G. One is a small rim fragment with angular grit tempering, partially smoothed vertical cord marking and an undecorated exterior lip fold. It has a black exterior surface and is both dense and hard. The rim is straight and the interior surface is smooth. The second sherd is brown with a large rim, partially smoothed vertical cord marking and a smooth interior surface. The cord marking on this sherd extends to a thinned lip which displays no fold. This sherd is somewhat chalky to the touch and was either not tempered or tempered with fine clay. Sherds similar to these are probably affiliated with the Plains Village Period in the Clinton Reservoir area (Johnson 1968).

Most of the points collected from the surface of the site are non-diagnostic due to incompleteness of the specimens. One point, illustrated in Plate 21:B, is made of fine grained, waxy chert with a mottled pink and brown color of a type not found in the area. The total length of this specimen is estimated to have been 40 millimeters and its width is 37 millimeters; its maximum thickness is 5.5 millimeters. The pronounced barbs of this point, which extend almost to the basal plane, are a result of deep corner notching. The point has been randomly flaked along the faces and finely retouched on the edges. The artifact cannot be identified with a known point type.

Another specimen, illustrated in Plate 20:C, is also almost complete. With an overall length of 43 millimeters and an estimated original length of 47 millimeters, this large, stemmed point is 9 millimeters thick. It is made out of common, light gray fossiliferous chert. It has not been assigned to any specific type although it most resembles the Ellis and Ensor points, which were used from the Late Archaic through the Central Plains Period (Hughes 1972). Another stemmed point, shown in Plate 20:E, resembles a Nolan point (Ibid.), which was used from the Late Archaic to early Central Plains Period.

Two other points from this site can be roughly typed. They are both small points only 3 and 5 millimeters thick respectively and both are broken on their distal ends. They were probably triangular in shape before they were broken.

TABLE 34

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0144

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-25 cm	
	to		sterile
	VIII	84-94 cm	
	IX	94-104 cm	1 interior flake
	X	104-114 cm	1 charcoal sample 2 debitage 2 interior flakes
	XI	114-124 cm	6 debitage 11 interior flakes
	XII	124-134 cm	2 utilized flakes 6 debitage 6 interior flakes
	XIII	134-144 cm	1 retouched flake 2 utilized flakes 8 debitage 18 interior flakes
	XIV	144-154 cm	2 debitage 9 interior flakes 1 fire cracked rock
	XV	154-164 cm	2 interior flakes
	XVI	164-174 cm	2 utilized flakes 2 interior flakes
	XVII	174-184 cm	1 charcoal sample 1 utilized flake
	I	0-30 cm	3 historic artifacts 6 interior flakes
	II	30-40 cm	
	to		sterile
	XI	120-130 cm	

TABLE 34 (continued)
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0144

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
	I	0-25 cm	4 historic artifacts
	II	25-50 cm	4 historic artifacts 1 charred wood 2 debitage 3 interior flakes
C	III	50-60 cm	
	to		sterile
	VI	80-90 cm	
	VII	90-100 cm	1 debitage
	I	0-43 cm	9 historic artifacts 3 secondary decortication flakes
	II	43-53 cm	1 secondary decortication flake
D	III	53-63 cm	
	to		sterile
	V	73-83 cm	
	VI	83-93 cm	1 <u>Bison bison cervical vertebra</u>
	VII	93-103 cm	
	to		sterile
	XIV	163-173 cm	
E	I	0-10 cm	1 interior flake
	II	10-20 cm	1 secondary decortication flake
	III	20-30 cm	1 charcoal fragment 1 debitage 1 secondary decortication flake

TABLE 34 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0144

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
E	IV	30-40 cm	sterile
	V	40-50 cm	sterile
	VI	50-60 cm	1 charcoal sample
	VII	60-70 cm	
	to		sterile
F	X	90-100 cm	
	XI	100-110 cm	1 interior flake
	I	0-10 cm	20 historic artifacts 1 retouched flake 6 interior flakes 2 secondary decortication flakes
G	II	10-20 cm	2 historic artifacts 1 notched flake 1 debitage
	I	0-10 cm	23 historic artifacts 7 interior flakes 2 secondary decortication flakes
	II	10-20 cm	44 historic artifacts 1 unmodified blade 1 debitage 2 interior flakes 1 primary decortication flake
	III	20-30 cm	2 historic artifacts 1 interior flake 1 primary decortication flake

TABLE 34 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0144

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
G	IV	30-40 cm	3 interior flakes
	V	40-50 cm	1 debitage
	VI	50-60 cm	sterile

The larger of the two points is made of a fine grained, light tan chert not commonly recovered in the Clinton area. It can be seen in Plate 20:A. The other point, shown in Plate 20:B, is of a common tan chert. Both points, based on the estimates of their original lengths, were less than twice as long as they are wide and they have been finely retouched on all edges and surfaces. They are typeable as either Fresno or Madison points (Bell 1960), which are characteristic of the Plains Village Period.

The remainder of the artifacts recovered during the investigations of the site were from subsurface tests and are summarized in Table 35. The artifacts present in this collection include the notched flake shown in Plate 21:A, utilized flakes, the unmodified blade shown in Plate 22:B, primary and secondary decortication flakes, interior flakes, retouched flakes, other debitage and a piece of fire cracked rock. Approximately 92% of the assemblage is composed of lithic debitage. The majority of the artifacts are made of common gray, pink and tan cherts with a relatively high frequency of rare red chert and smaller amounts of rare black chert.

One historic and two prehistoric cultural horizons have been identified as a result of test excavations at site 14D0144. The lack of in situ diagnostics in the prehistoric horizons prevents assignment of a definitive temporal position to each horizon. Artifacts collected from the historic horizon represent the remains of a domestic site occupied during the early 20th century, as evidenced by a structural foundation west of the site. This horizon is primarily confined to the plowzone and surface of the site.

The historic occupation is partially superimposed upon the upper prehistoric horizon. Prehistoric artifacts recovered from this horizon include interior flakes, primary and secondary decortication flakes, a blade and a notched flake. The lower occupational horizon is represented by artifacts

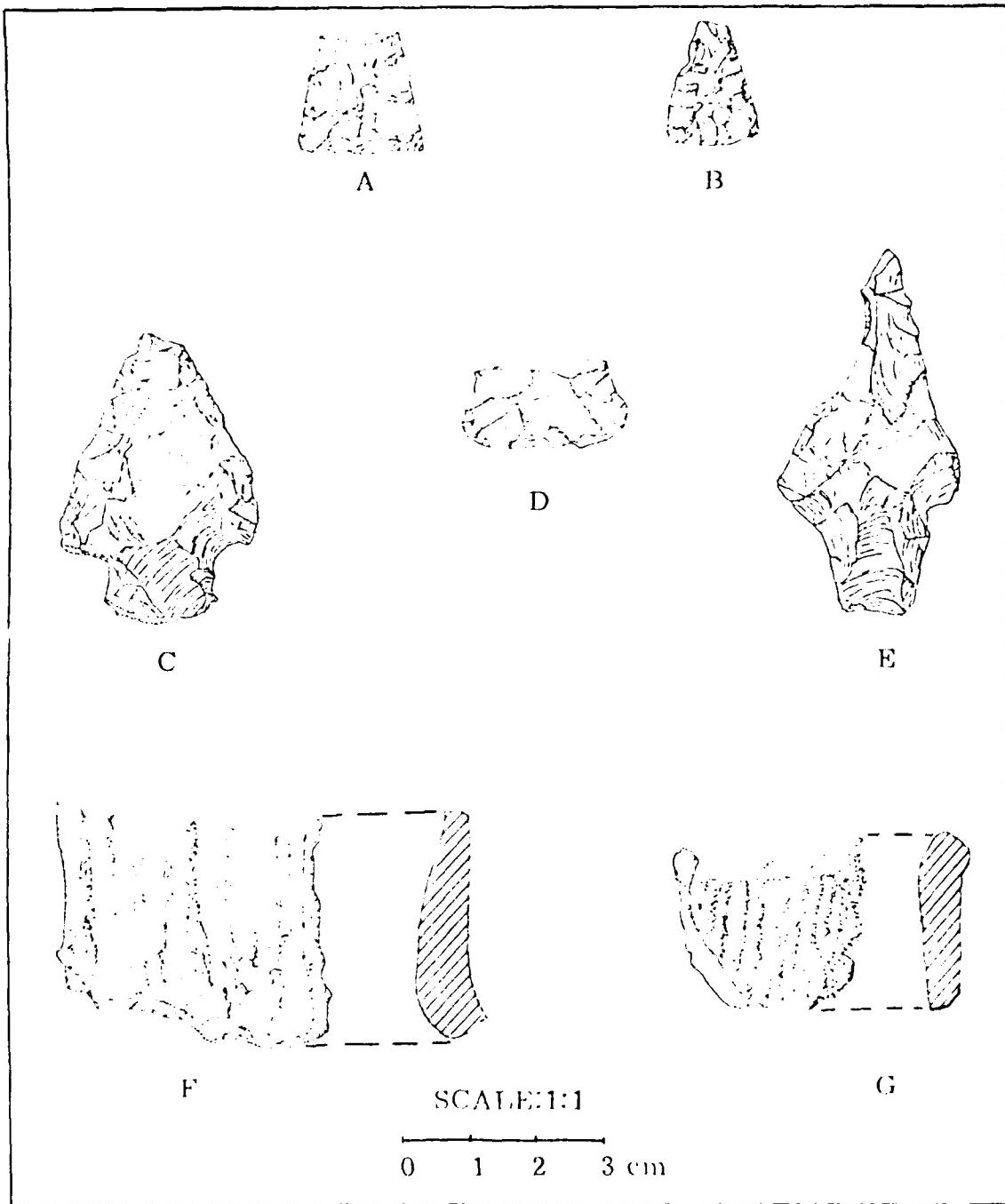


PLATE 20

Chipped Stone and Ceramic Artifacts from 1450144. (A) and (B) Small, triangular, unnotched point fragments. (C) Large, stepped point. (D) Point base. (E) Large, stepped point. (F) Grid marked, clay tempered or intercalated rim sherd. (G) Grid marked, grit tempered rim sherd.

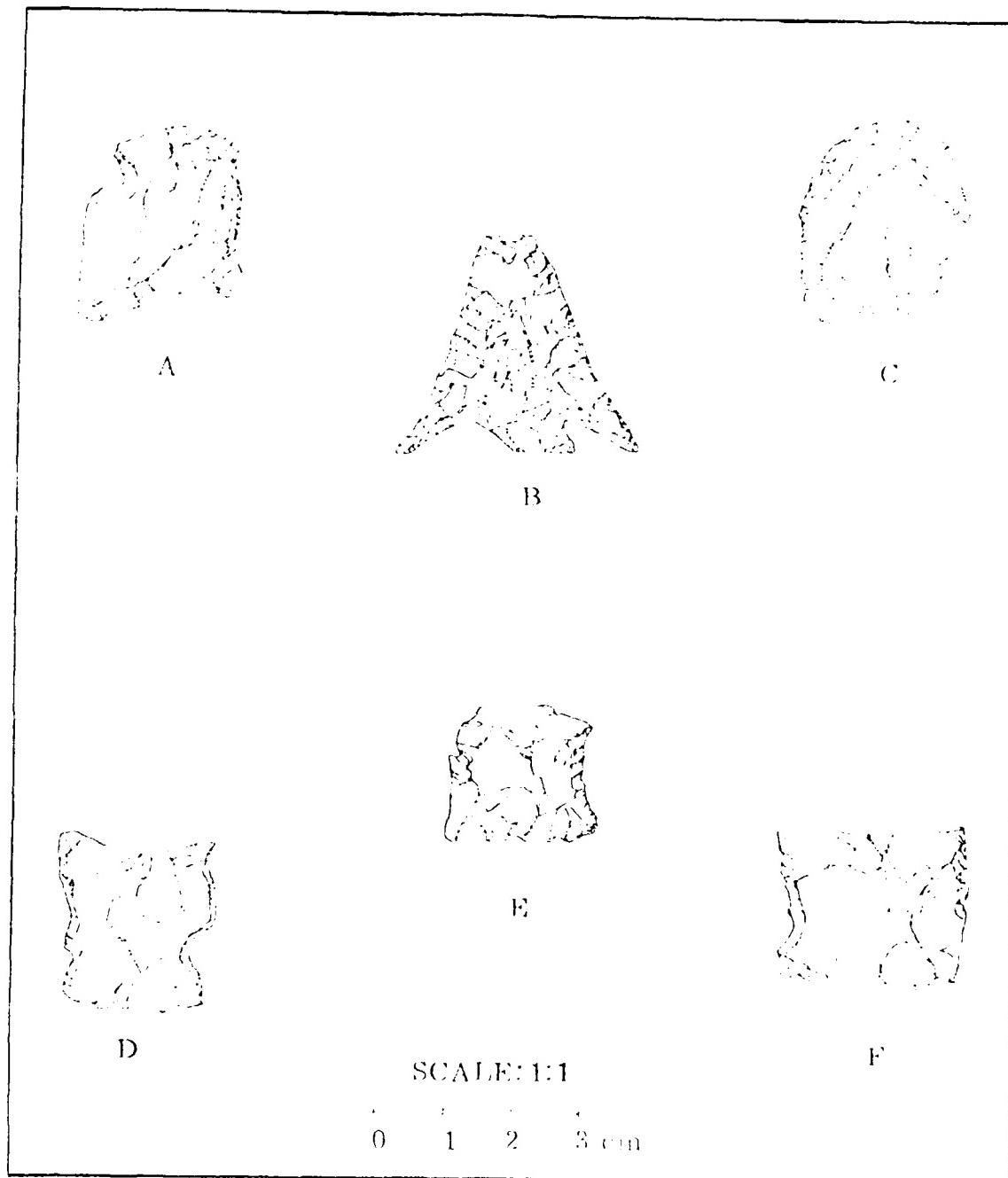


PLATE 21

Chipped stone artifacts from 14-0144, 14-0148, and 14-0154. (A) Notched point fragment from 14-0144. (B) Large, flaked point fragment from 14-0144. (C) Notched point fragment from 14-0144. (D) Point fragment from 14-0154. (E) Notched fragment from 14-0148. (F) Modified point fragment from 14-0154.

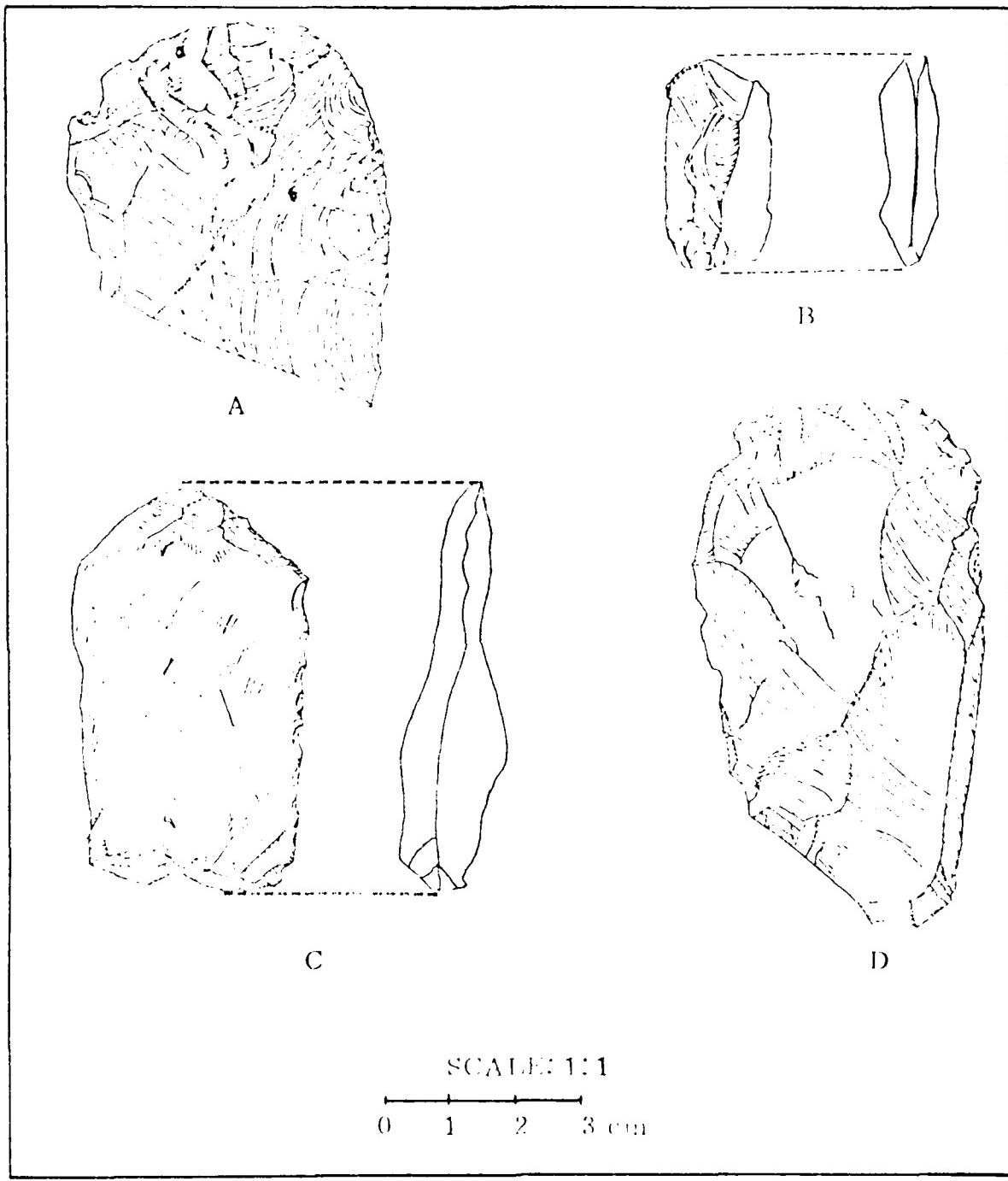


PLATE 22

Chipped Stone Artifacts from Site 134, San Felipe, New Mexico. (B) Unifacial blade; (C) bifacial blade; (D) retouched flake.

INVENTORY OF EXCAVATED MATERIALS, SITES 14D0144.

Category	Raw Material												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
1. Stone	1	1	1	1	1	1	1	1	1	1	1	1	1
2. Bone	1	1	1	1	1	1	1	1	1	1	1	1	1
3. Wood	1	1	1	1	1	1	1	1	1	1	1	1	1
4. Shell	1	1	1	1	1	1	1	1	1	1	1	1	1
5. Other	1	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL	8	1	3	23	13	1	6	6	1	1	1	1	1
	5.4	0.1	3.7	6.7	3.7	31.6	11.8	1.5	10.3	1.7	0.7	1	1

found between 90 and 184 centimeters in test A, and possibly C, D and E. These artifacts include a preponderance of interior flakes but lack the decortication flakes found in the upper horizon.

The diagnostic artifacts recovered at this site indicate Archaic through Central Plains occupations. Test excavations indicate the presence of stratified components at this site. Although no features were observed, the recovery of the bison vertebra suggests the possible presence of preserved organic remains such as charcoal and faunal remains.

14D0145

At an elevation of 308 meters (1,010 feet), this broad ridgetop site directly above Dry Creek is at one of the highest locations investigated during the 1978 field season. The length of the site follows a dirt road, and the site's dimensions have been estimated to be approximately 90 x 300 meters. The site covers an area of approximately 27,000 square meters. The site is 1.2 kilometers (0.75 mile) northwest of the Wakarusa River and a little over one kilometer (0.6 mile) from site 14D0144.

Four 1 x 1 meter test pits were excavated in order to determine the existence and extent of subsurface deposits. Tests A and B were randomly

placed within the site area while tests C and D were placed near the presumed edge of the site. Test A was excavated to a depth of 40 centimeters, and artifacts were found to a depth of 30 centimeters. Test B produced artifacts throughout its depth of 50 centimeters. Test C yielded only one artifact in the first 10 centimeters and was thereafter sterile to 30 centimeters, and test D was sterile throughout its 40 centimeters. No subsurface features or structural remains were found during the test excavations. Stratigraphic summaries of these excavations are presented in Table 36.

In order to supplement the test pit data, shovel testing was conducted at the site. A grid oriented to magnetic north was laid out over the site area and six east-west transects were laid out; two transects flanking the road were 10 meters apart while the other four were at 20 meter intervals. Shovel test pits of 30 x 30 x 30 centimeters were then placed at 20 meter intervals along the transects.

The Martin-Oska silty clay loam soils complex on which this site is located has many small to large fragments of limestone and chert at or near the surface. A distinct plowzone was revealed in tests A and D between 15 and 20 centimeters below the surface. In test B a soil change occurred at a depth of 25 centimeters while in test C soils in the 20 to 30 centimeter level were noticeably more compact than in the preceding levels. On the basis of these data it seems that the soils at this site have not been deeply cultivated in recent time.

A total of 42 artifacts were recovered from test excavations at site 14D0145, but no diagnostic specimens were found. The collection includes three utilized flakes, 29 interior flakes, nine secondary decortication flakes and a primary decortication flake. The raw materials are of common tan, gray and beige cherts as well as patinated variants of pink chert. The artifact collection from this site is summarized in Table 37.

14D0148

This site overlooks the Wakarusa Valley to the northeast. It is located near the edge of a broad, nearly level lobe in the Upland Prairie zone near sites 14D0127, 14D0128 and 14D0129 and has an elevation of 290 meters (950 feet). Based on observations made during the 1978 testing program, the site is determined to be small, covering 4,500 square meters with estimated dimensions of 30 x 150 meters. The site is in an excellent location for viewing the valley floor. In 1978, an outcropping of hematite was discovered at the eastern edge of the site, and this source of pigment stone may have been a reason for prehistoric visits to the area.

Six 1 x 1 meter test pits were excavated at the site. A, B, C, D and E were randomly located on the 1976 survey transects while F was selectively placed to confirm the northern site boundary. Stratigraphic summaries of these test excavations are presented in Table 38. Test pit A was the deepest excavation unit, yielding artifacts to its conclusion at a depth of 45 centimeters. The four other randomly placed test pits all yielded artifacts to a maximum depth of 25 centimeters. Test pit F was sterile of cultural materials.

TABLE 36
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0145

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	3 interior flakes 1 primary decortication flake
	II	10-20 cm	1 utilized flake 4 interior flakes 2 secondary decortication flakes
	III	20-30 cm	1 utilized flake 2 secondary decortication flakes
	IV	30-40 cm	sterile
B	I	0-10 cm	3 interior flakes
	II	10-20 cm	5 interior flakes 3 secondary decortication flakes
	III	20-30 cm	10 interior flakes 1 secondary decortication flake
	IV	30-40 cm	1 utilized flake 2 interior flakes 1 secondary decortication flake
	V	40-50 cm	1 interior flake
C	I	0-10 cm	1 interior flake
	II	10-20 cm	sterile
	III	20-30 cm	sterile
D	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile
	IV	30-40 cm	sterile

TABLE 37
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0145

ARTIFACT TYPES	RAW MATERIALS				TOTAL	%
	01	07	08	12		
051	.	.	1	2	3	7.1
080	.	.	.	1	1	2.4
081	.	1	1	7	9	21.4
082	2	1	4	22	29	69.1
TOTAL	2	2	6	32	42	
%	4.8	4.8	14.2	76.1		100%

The site is located on Sharpsburg silt loam and is undergoing active erosion as it is situated at the head of a draw which is cutting the upland. Erosion at the site has produced a complex stratigraphic situation. Test pits B and D apparently had their plowzones eroded away, and the upper sterile layers of these test pits suggest that new soils have recently been deposited over eroded, truncated cultural strata. Similar erosional and depositional processes may account for the relatively deep, 35 centimeter, plowzone in test pit A. No evidence of intact subsurface cultural features was encountered.

A small assemblage of 36 artifacts, including an historic metal object, was recovered as a result of the testing of the site. The prehistoric artifacts are summarized in Table 39. Because no diagnostic artifacts were recovered, the temporal position of the site cannot be determined on the basis of the available data. The only prehistoric tools in the assemblage are a biface fragment and two utilized flakes, all made of gray chert. The biface fragment is possibly a projectile point stem and is shown in Plate 21:E. The remainder of the assemblage is lithic debitage. Only 16 pieces of lithic debitage were collected in the 1976 survey at this site (Iroquois Research Institute 1977).

TABLE 38
STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0148

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-35 cm	9 interior flakes 4 secondary decortication flakes
	II	35-45 cm	2 interior flakes 1 secondary decortication flake
B	I	0-2.5 cm	sterile
	II	2.5-12 cm	sterile
	III	12-22 cm	1 interior flake
C	I	0-14 cm	1 historic artifact 2 interior flakes
	II	14-24 cm	sterile
	III	24-34 cm	sterile
D	I	0-5 cm	sterile
	II	5-15 cm	2 interior flakes
	III	15-25 cm	2 secondary decortication flakes
E	I	0-10 cm	1 biface fragment 2 utilized flakes 7 interior flakes
	II	10-20 cm	2 interior flakes
	III	20-30 cm	sterile
F	I	0-10 cm	sterile
	II	10-20 cm	sterile
	III	20-30 cm	sterile

TABLE 39

INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14DO148

ARTIFACT TYPES	RAW MATERIALS			TOTAL	%
	07	08	10		
028	1	.	.	1	2.9
051	2	.	.	2	5.7
081	7	.	.	7	20.0
082	17	4	4	25	71.4
TOTAL	27	4	4	35	
%	77.1	11.4	11.4		100%

14DO154

This site is located on a second terrace above Deer Creek at an elevation of 268 to 274 meters (880 to 900 feet). It is 50 meters east of site 14DO3 and was originally defined as part of that site. Subsequently it was determined to be a separate site. It covers an estimated area of 9,600 square meters, with dimensions of approximately 80 x 120 meters. The site is located in a cultivated field.

Five 1 x 1 meter test pits were excavated at the site. Tests A, B and C were placed along 1976 survey transects which had a high surface concentration of artifacts. Tests D and E were selectively placed in areas of high surface artifact concentrations. Excavation depths in the test pits ranged from 30 to 47 centimeters. In test A artifacts were recovered to a depth of 27 centimeters, test B yielded artifacts to 47 centimeters, and in test C artifacts were recovered to a maximum depth of 18 centimeters. Test D was sterile of cultural materials in the top 18 centimeters, but below that depth yielded artifacts to 30 centimeters. Test E yielded artifacts in the upper two 10 centimeter levels, was sterile in the third level, and again yielded artifacts to its conclusion in the fourth level at 40 centimeters. A stratigraphic summary of recovered cultural materials is presented in Table 40.

TABLE 40

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0154

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-17 cm	8 utilized flakes 20 interior flakes 4 secondary decortication flakes
	II	17-27 cm	2 interior flakes
	III	27-37 cm	sterile
B	I	0-17 cm	1 retouched flake 4 utilized flakes 33 interior flakes 1 secondary decortication flake
	II	17-27 cm	1 utilized flake 4 interior flakes
	III	27-37 cm	1 interior flake
	IV	37-47 cm	1 interior flake
C	I	0-18 cm	2 cores 6 utilized flakes 38 interior flakes 2 secondary decortication flakes
	II	18-28 cm	sterile
	III	28-38 cm	sterile
D	I	0-10 cm	sterile
	II	10-20 cm	2 interior flakes 1 secondary decortication flake
	III	20-30 cm	1 interior flake

TABLE 40 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0154

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
E	I	0-10 cm	4 interior flakes
	II	10-20 cm	1 utilized flake 4 interior flakes
	III	20-30 cm	sterile
	IV	30-40 cm	1 retouched flake 1 secondary decortication flake

The test pit soil profiles for A, B, C and D revealed a plowzone ranging from 10 to 25 centimeters. The fifth test, E, was situated along the wooded terrace edge on the northern periphery of the site. The soil profile of this pit revealed a silty loam topsoil horizon which extended to a depth of 28 centimeters. Test pits A, B and D contained cultural materials below the plowzone. The lack of recent deep plowing at the site may explain the recovery of undisturbed artifacts below the plowzone.

Two soil types are present at this site. The well drained Gymer silt loam, found in the cultivated portions of the site, was formed from loess and glacio-fluvial sediments. The short, steep slope that makes up the terrace scarp is occupied by the Vinland-Martin silty clay loam complex. The northern section of the site may be on this soil type. The severe erosion which has occurred around the edge of the cultivated field offers a potential explanation for the presently shallow depth of the plowzone. Part of the soil, washed from the cultivated portion of the site, has accumulated as sediment in the narrow strip of second growth woodland bordering the downslope edge of the terrace. The plowzone is a brown to dark grayish brown soil. Deeper soil horizons range in color from strong brown to dark reddish brown.

An apparently intact prehistoric hearth, identified by an irregularly shaped stain, was found in test A. The stain was first observed at a depth of 17 centimeters in the northeast quadrant of test A and extended to a depth of 27 centimeters. The feature matrix consisted of a concentration of carbonized wood, burned limestone fragments and charcoal fragments which were collected

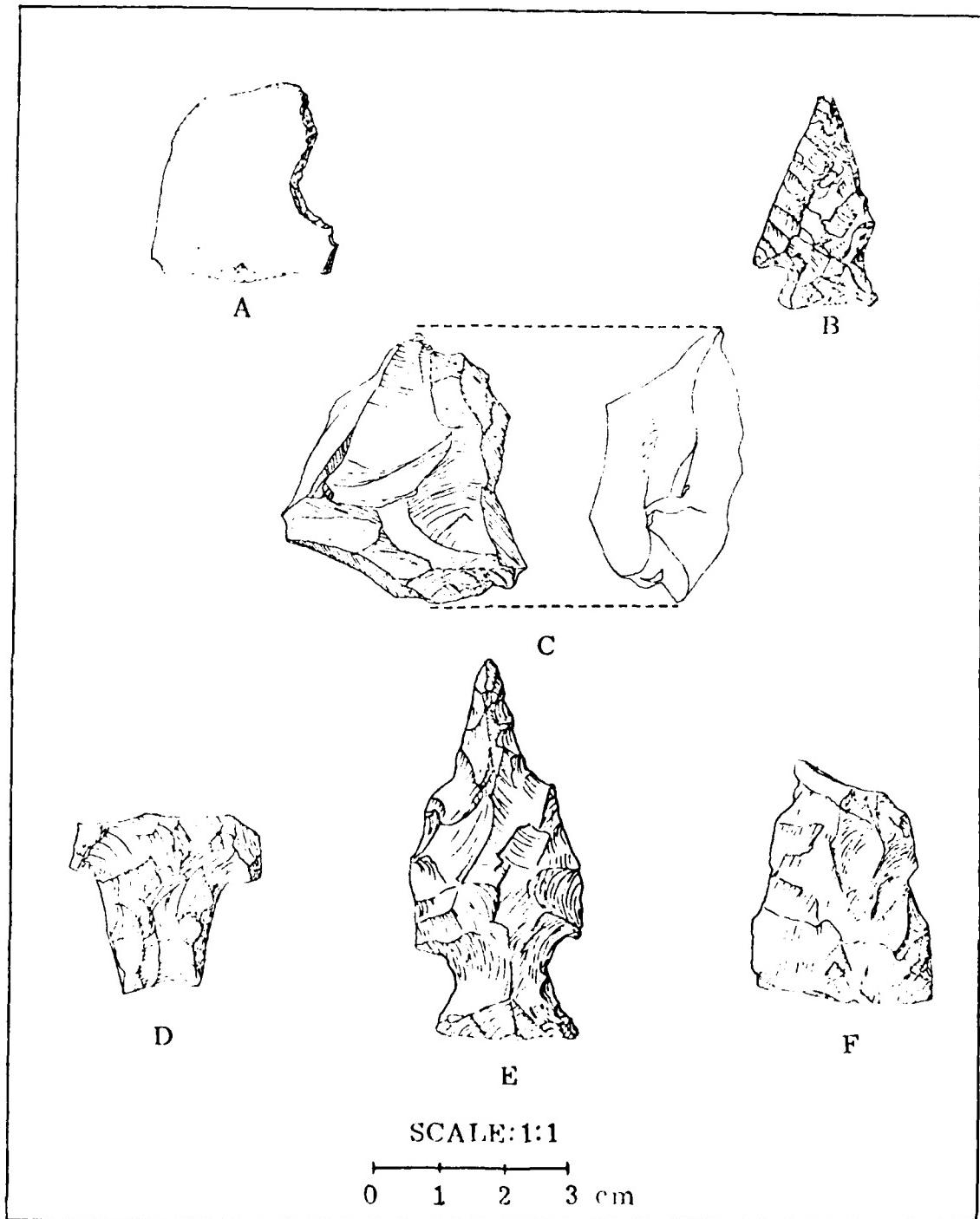


PLATE 23

Chipped Stone Artifacts from 14D0154. (A) Sp. Reshaver. (B) Medium-sized, expanding stemmed point. (C) Core. (D) Large, contracting stemmed point fragment. (E) Large, expanding stemmed point modified for use as a drill or perforator. (F) Biface fragment.

TABLE 41

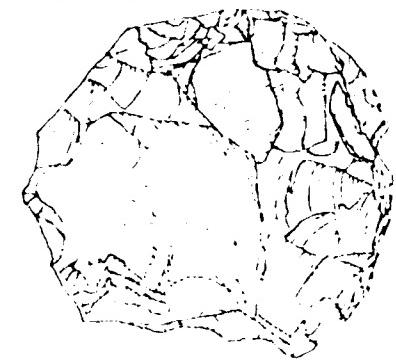
Inventory of Prehistoric Excavated Materials, Site 14D0154

ARTIFACT TYPES	RAW MATERIALS						TOTAL	%
	01	02	04	07	08	12		
051	5	.	.	5	.	10	20	14.0
053	.	.	.	.	.	2	2	1.4
077	1	.	.	.	.	1	2	1.4
081	.	.	1	7	.	1	9	6.3
082	31	1	3	46	18	11	110	76.9
TOTAL	37	1	4	58	18	25	143	
%	25.9	0.7	2.8	40.5	12.6	17.5		100%

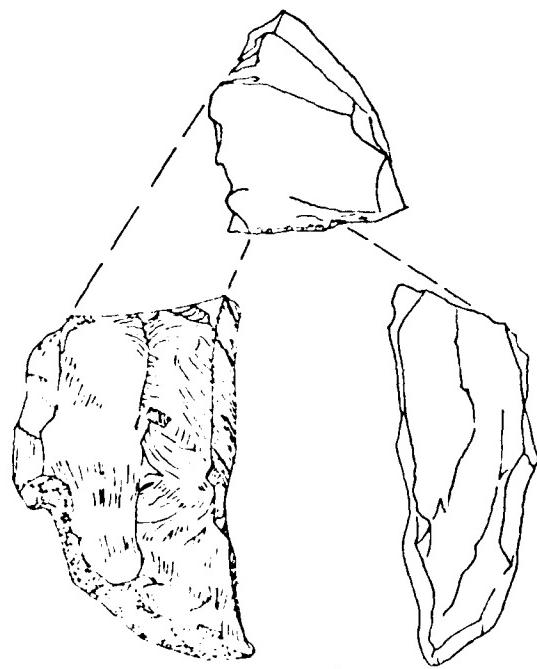
for radiocarbon age determination. One sample yielded a radiocarbon age of 840 ± 150 years B.P. and another was assayed at $1,040 \pm 150$ years B.P. Since these represent the same feature, the best estimate of age is about 950 years B.P. (Krueger 1980). The subsoil containing the feature was mottled with charcoal and contained a brown soil lense.

Testing of site 14D0154 yielded 143 prehistoric lithic artifacts. The artifact assemblage includes utilized flakes, cores, secondary decortication flakes, interior flakes and retouched flakes. The majority of the recovered artifacts are interior flakes and there is a relative abundance of utilized flakes. Common gray, beige, tan and pink cherts are the predominant raw materials, as can be seen in Table 41

In addition to the excavated artifacts, 16 prehistoric artifacts were selectively collected from the surface, including modified flakes, a spokeshave, modified points, a projectile point and point fragments, a ground stone celt fragment, a uniface knife, a bifacial scraper, biface fragments, utilized flakes and a retouched flake. The spokeshave and scraper are illustrated in Plate 23:A and Plate 24:A, respectively.



A



B

SCALE: 1:1

0 1 2 3 cm

PLATE 24

Chipped Stone Artifacts from 14D0154 and 14D0310. (A) Bifacial scraper from 14D0154.
(B) Core from 14D0310.

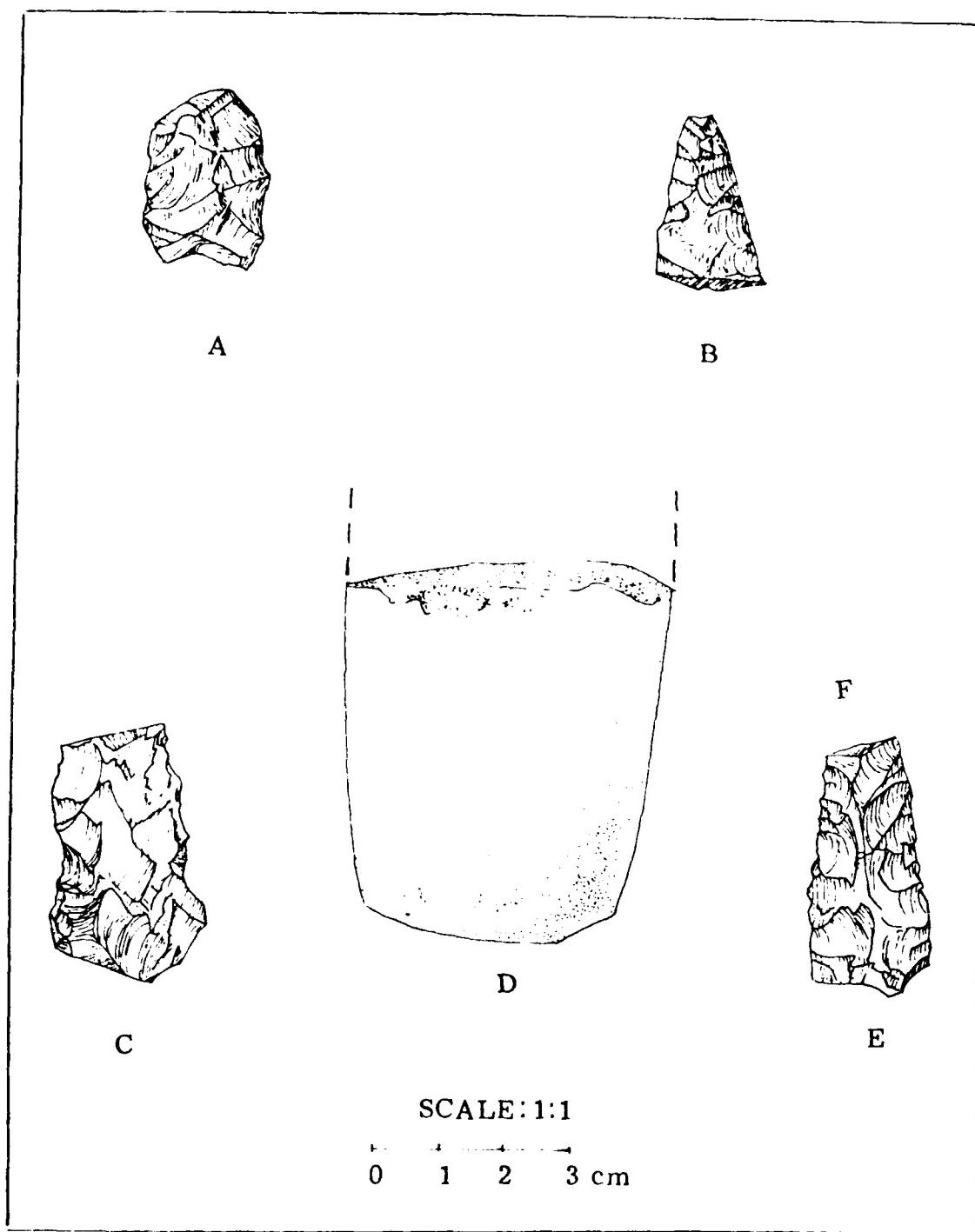


PLATE 25

Chipped Stone and Ground Stone Artifacts from 14D0154. (A) Biface fragment. (B) Point tip fragment. (C) Biface fragment. (D) Greenstone celt fragment. (E) Point midsection.

One projectile point specimen is a basal fragment which resembles the base of a Langtry point. It is illustrated in Plate 23:D. The specimen has prominent shoulders with a contracting stem and incurvate base. This type has an assigned time range extending from A.D. 1 to A.D. 1000 (Hughes 1972), which spans the Plains Woodland and early Central Plains Periods in the Southern Plains. A nearly complete, medium-sized, expanding stemmed point is shown in Plate 23:B. It is morphologically similar to items reported from Plains Woodland contexts in southeastern Kansas (Marshall 1972). A complete point, shown in Plate 23:E, is similar to the Lange point type, which has a long period of use ranging from the Archaic to the early Central Plains Periods (Bell 1958:36). The Lange point is characterized by large corner notching with an expanding stem and relatively straight base. This specimen appears to have been reworked into a perforator or drill. The large fragment of a greenstone celt shown in Plate 25:D, probably represents a Central Plains occupation (Johnson 1968).

Two projectile points were recovered at the site during the 1976 survey (Iroquois Research Institute 1977). One, a large triangular point, is typologically similar to the Abasolo point type of the Woodland Period (Bell 1958), and the other is a small, side notched Washita point, which is a Central Plains diagnostic (*Ibid.*). In addition, six cord marked, grit and sand tempered body sherds probably relating to the Plains Woodland Period were collected during the 1976 survey (Iroquois Research Institute 1977).

The wide variety and relative abundance of artifacts at site 14D0154 as well as the hearth suggest that either site 14D0154 was the location of a fairly intensive and possibly long-term occupation or the site was repeatedly visited during prehistoric times. The temporal ranges of the collected diagnostic artifacts indicate Plains Woodland and Central Plains occupations, and possibly an Archaic occupation.

14D0309

This site, located on a southwest projecting lobe of a gently sloping upland ridge, was first located by John Reynolds of the Kansas State Historical Society in August 1976 (Iroquois Research Institute 1977). The site, at an elevation of 290 to 293 meters (950 to 960 feet), overlooks the Wakarusa River floodplain to the south and Coon Creek to the west. The areal extent of the site is estimated at 11,050 square meters, with approximate dimensions of 85 x 130 meters.

Six 1 x 1 meter excavation units were allocated for the testing of this site. Test pits A, B, C and D were randomly placed along high density transects that were used during the 1976 survey. The remaining two tests, E and F, were placed in order to delineate the southern periphery of the site. Test pits A, B and C were located within the previously cultivated portion of the site while tests D, E and F were located along the wooded terrace edge to the south. The depth of excavations ranged from 30 to 60 centimeters. A stratigraphic summary of the materials recovered from the test excavations is presented in Table 42.

TABLE 42

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0309

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-10 cm	2 utilized flakes 1 debitage
	II	10-20 cm	Artifacts missing (one possible piece of field chert reported in field notes)
	III	20-30 cm	sterile
B	I	0-10 cm	6 utilized flakes 5 debitage 5 interior flakes
	II	10-20 cm	5 utilized flakes 6 debitage 5 interior flakes
	III	20-30 cm	1 utilized flake 1 debitage 1 interior flake
C	I	0-10 cm	2 retouched flakes 5 utilized flakes 1 core fragment 5 debitage 3 interior flakes
	II	10-20 cm	2 utilized flakes 3 debitage
	III	20-30 cm	3 utilized flakes
	IV	30-40 cm	1 utilized flake
	V	40-50 cm	sterile

TABLE 42 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14B0309

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
D	I	0-10 cm	1 retouched flake 6 utilized flakes 7 debitage 7 interior flakes 1 secondary decortication flake
	II	10-20 cm	1 retouched flake 4 utilized flakes 5 interior flakes 8 debitage
	III	20-30 cm	1 core fragment 3 utilized flakes 10 debitage 10 interior flakes
	IV	30-40 cm	1 retouched flake 3 utilized flakes 1 core fragment 13 debitage 10 interior flakes 1 primary decortication flake
	V	40-50 cm	1 utilized flake 1 debitage
	VI	50-60 cm	1 debitage
E	I	0-10 cm	1 debitage 2 interior flakes
	II	10-20 cm	1 primary decortication flake
	III	20-30 cm	1 utilized flake 1 debitage 2 interior flakes
	IV	30-40 cm	1 utilized flake 4 debitage 2 interior flakes

TABLE 42 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0309

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
E	V	40-50 cm	1 interior flake
	VI	50-60 cm	1 interior flake
	I	0-10 cm	2 utilized flakes 13debitage 5 interior flakes 1 secondary decortication flake
F	II	10-20 cm	5 utilized flakes 15debitage 8 interior flakes 1 primary decortication flake
	III	20-30 cm	1 utilized flake 4debitage 6 interior flakes 4 secondary decortication flakes
	IV	30-40 cm	1 utilized flake 2 interior flakes 1 debitage
	V	40-50 cm	sterile

Test A yielded artifacts to a depth of 20 centimeters while test B yielded artifacts to a depth of 30 centimeters. Artifacts were recovered to a depth of 40 centimeters in tests C and F. The deepest deposits of artifacts, to 60 centimeters, were encountered in tests D and E, which were situated along the wooded terrace edge. This suggests that the terrace edge is an area of high artifact concentration which has received little disturbance by historic period cultivation.

143/144

INVESTIGATION OF PRECIPITATION IN GROUND MATERIALS 117

The plowzone ranged from 25 to 40 centimeters in depth. Test C was the only test excavated in the formerly cultivated portion of the site which contained cultural material in horizons below the apparent plowzone. This may indicate the presence of undisturbed cultural remains. However, no subsurface features were encountered during testing.

The Oska silty clay loam at this site has formed in place by weathering of the underlying limestone which outcrops downslope from the site. The soil is well drained and is moderately eroded as a result of cultivation. The plowzone at the site is composed of a dark yellowish brown soil. In those pits excavated along the wooded terrace edge, the topsoil horizon consists of a dark brown soil which contains root intrusions, animal burrow remnants and limestone fragments.

During the 1978 testing, 245 prehistoric lithic artifacts were recovered. The assemblage includes utilized flakes, retouched flakes, core fragments, primary decortication flakes, secondary decortication flakes, interior flakes and otherdebitage. No culturally diagnostic artifacts were recovered, so assignment of the site to a cultural period cannot be made on the basis of available data. Lithicdebitage represents the highest percentage of recovered artifacts, 75.1%, and a relatively high percentage of utilized flakes was also recovered.

A majority of the assemblage is comprised of locally available tan and gray cherts, as shown in Table 43. The tan chert is similar to that found at

TABLE 44

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0310

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
A	I	0-14 cm	sterile
	II	14-24 cm	sterile
	III	24-34 cm	sterile
B	I	0-17 cm	2 secondary decortication flakes
	II	17-27 cm	11 interior flakes 8 secondary decortication flakes
	III	27-37 cm	1 pigment: hematite 1 polyhedral blade core 25 interior flakes 8 secondary decortication flakes
	IV	37-47 cm	sterile
C	I	0-22 cm	1 interior flake
	II	22-32 cm	1 interior flake 1 secondary decortication flake
D	I	0-10 cm	Artifacts missing: 98 lithic artifacts reported
	II	10-20 cm	33 interior flakes 17 secondary decortication flakes 2 primary decortication flakes
	III	20-30 cm	sterile

TABLE 44 (continued)

STRATIGRAPHIC SUMMARY OF EXCAVATIONS, SITE 14D0310

TEST PIT	LEVEL	DEPTH	MATERIALS RECOVERED
E	I	0-10 cm	7 interior flakes 2 secondary decortication flakes
	II	10-20 cm	3 fossils 1 blade side scraper 8 interior flakes 6 secondary decortication flakes
	III	20-30 cm	sterile
	IV	30-40 cm	sterile

site 14D0140, a possible quarry collection site located about 2.2 kilometers (1.4 miles) to the northwest of site 14D0309, which suggests that some of the material extracted from site 14D0140 may have been transported to other sites for final stages of tool manufacture.

14D0310

This site is located on a broad, gently sloping ridgeline north of the Wakarusa River at an elevation of 290 meters (950 feet). Here the upland slopes southward toward the river. The site was discovered by John Reynolds in August 1976 (Iroquois Research Institute 1977). Once under cultivation, the area has been reseeded in native grasses. The site covers an area of approximately 15,000 square meters. Its dimensions have been estimated to be 150 x 100 meters. The site was tested to determine its temporal position and the presence or absence of undisturbed cultural strata.

Five 1 x 1 meter pits were excavated at the site. Test pits A, B and C were randomly placed along 1976 transect alignments while test pits D and E were selectively located to determine site boundaries. Test A was excavated to a depth of 34 centimeters and was sterile. Test B was excavated to 47 centimeters with artifacts present to a depth of 32 centimeters. Test C yielded artifacts to its conclusion at 32 centimeters. Test D was placed in the southwest quadrant of the site and yielded artifacts to a depth of 20 centimeters, as did test E. Stratigraphic summaries of these test pits are presented in Table 44. The artifacts from test B, the deepest pit, were

TABLE 45
INVENTORY OF PREHISTORIC EXCAVATED MATERIALS, SITE 14D0310

ARTIFACT TYPES	RAW MATERIALS					TOTAL	%
	01	04	07	08	16		
062	.	.	1	.	.	1	0.7
070	.	.	1	.	.	1	0.7
080	.	.	2	.	.	2	1.5
081	1	1	41	1	.	44	32.6
082	1	.	73	12	.	86	63.7
201	.	.	.	.	1	1	0.7
TOTAL	2	1	118	13	1	135	
%	1.5	0.7	87.4	9.6	0.7		100%

primarily below the plowzone. There were no features or structural remains associated with prehistoric occupations uncovered during the excavation.

The soils of the ridgeline on which this site occurs are classified as Oska silty clay loam. These soils have formed as a result of the weathering of the underlying limestone. They are well drained and have a moderate shrink swell potential. They also have been moderately eroded by historic agricultural practices. On the basis of the 1978 test excavations, the depth of the plowzone was established as varying between 15 and 30 centimeters below the ground surface. Limestone and sandstone inclusions were present in the 10 to 30 centimeter levels in test D, but no distinct plowzone was observed. The apparently extensive erosion of the upper soil has resulted in the occurrence of subsoils rich in limestone and sandstone close to the modern ground surface.

A total of 135 prehistoric artifacts were collected during the investigation of the site and are summarized in Table 45. The collection includes a high percentage of secondary decortication flakes and interior flakes and a low percentage of primary decortication flakes, as well as a core and utilized

flakes. The one core recovered is illustrated in Plate 24:B. Gray chert is the predominant raw material represented at the site, followed by pink, beige and brown cherts. One piece of ground hematite was also recovered. No culturally diagnostic artifacts were recovered, which precludes the assignment of a temporal position to the site. Artifacts collected during the 1976 survey include modified flakes, a large triangular biface, a corner notched basal fragment, miscellaneous bifaces, and debitage (Ibid.).

Description of Surveyed Sites

The 28 prehistoric and historic sites inventoried during the 1979 field survey of the Clinton Lake project area are shown in Plate 7 and described in the following pages. Specific details of individual site locations are not included in these descriptions so as to protect the resources from vandalism and looting. The sites are discussed in sequential order by official trinomial site numbers assigned by the Kansas State Historical Society.

14D0155

This prehistoric site was discovered on a second terrace of Deer Creek. An elongated scatter of prehistoric lithic artifacts was observed along the terrace edge in a harvested milo field which had not yet been disced for spring planting. The site is at an elevation of 274 to 277 meters (900 to 910 feet) and is located 25 meters west of an intermittent tributary of Deer Creek. Surface collections and shovel tests indicate that the site occupies a surface area of approximately 6,325 square meters, with dimensions estimated at 120 meters north-south x 60 meters east-west.

When the site was revisited its surface extent was estimated and a grid origin was established in the apparent center of the site. Surface examination of the site indicated that it is oval in shape and that the major concentration of artifacts is located in the southwest quadrant of the site. This area was gridded into 20 x 20 meter squares for controlled surface collections. The northeast 10 x 10 meter section of each grid unit was intensively collected while artifacts were selectively collected from the remainder of the surface area. Approximately 3,500 square meters of surface area were examined by this method. The remaining quadrants were not gridded because of the low density of surface artifacts, but they were intensively collected.

Shovel tests were conducted at 10 meter intervals along the cardinal axes of the grid in an attempt to determine the horizontal extent of the site. However, of the 15 shovel tests, only three yielded cultural material. Shovel tests revealed the presence of a silty clay soil which is classified as Oska silty clay loam.

An inventory of recovered artifacts is presented in Table 46. Lithic artifacts which were recovered include projectile points and point fragments, a point modified for use as a perforator or drill, a point preform, biface fragments, bifacial scrapers, a unifacial scraper, a chopper, utilized flakes,

16, 2012

ANALYSIS OF PREHISTORIC RECOVERED MATERIALS, SITE 140055

ITEM NO.	RAW MATERIALS											TOTAL
	01	02	03	04	05	06	07	08	09	10	11	
001	1	1	1	1	1	1	1	1	1	1	1	1.0
003	1	1	1	1	1	1	1	1	1	1	1	1.0
004	1	1	1	1	1	1	1	1	1	1	1	1.0
005	1	1	1	1	1	1	1	1	1	1	1	1.0
006	1	1	1	1	1	1	1	1	1	1	1	1.0
008	1	1	1	1	1	1	1	1	1	1	1	1.0
018	1	1	1	1	1	1	1	1	1	1	1	1.0
028	2	2	2	2	2	2	2	2	2	2	2	2.0
037	1	1	1	1	1	1	1	1	1	1	1	1.0
050	1	1	1	1	1	1	1	1	1	1	1	1.0
051	3	3	3	3	3	3	3	3	3	3	3	3.0
052	1	1	1	1	1	1	1	1	1	1	1	1.0
153	2	2	2	2	2	2	2	2	2	2	2	2.0
027	1	1	1	1	1	1	1	1	1	1	1	1.0
054	6	6	6	6	6	6	6	6	6	6	6	6.0
082	2	2	2	2	2	2	2	2	2	2	2	2.0
083	1	1	1	1	1	1	1	1	1	1	1	1.0
TOTAL	15	1	2	50	3	4	3	4	3	4	4	12.0
%	20.0	0.8	1.7	41.3	2.5	3.3	1.5	7.4	15.7	10.8	11.3	100.0

a flake tool, a core, secondary decortication flakes, interior flakes and retouched flakes. Gray and beige cherts are the most common lithic raw materials in the artifact collections.

Three large, expanding stemmed points were identified. One, illustrated in Plate 26:B, is corner notched with a straight to slightly incurvate base and is biconvex in cross section. The specimen is 43 millimeters in length, 24 millimeters wide at the base and 9 millimeters thick. Another point, shown in Plate 26:A. is corner notched with an excurvate base and is biconvex in cross section. It is 36 millimeters in length, 19.5 millimeters wide at the base and 7 millimeters thick. The third point is also corner notched with an excurvate base. This specimen is 53 millimeters long, its base is 25 millimeters wide,

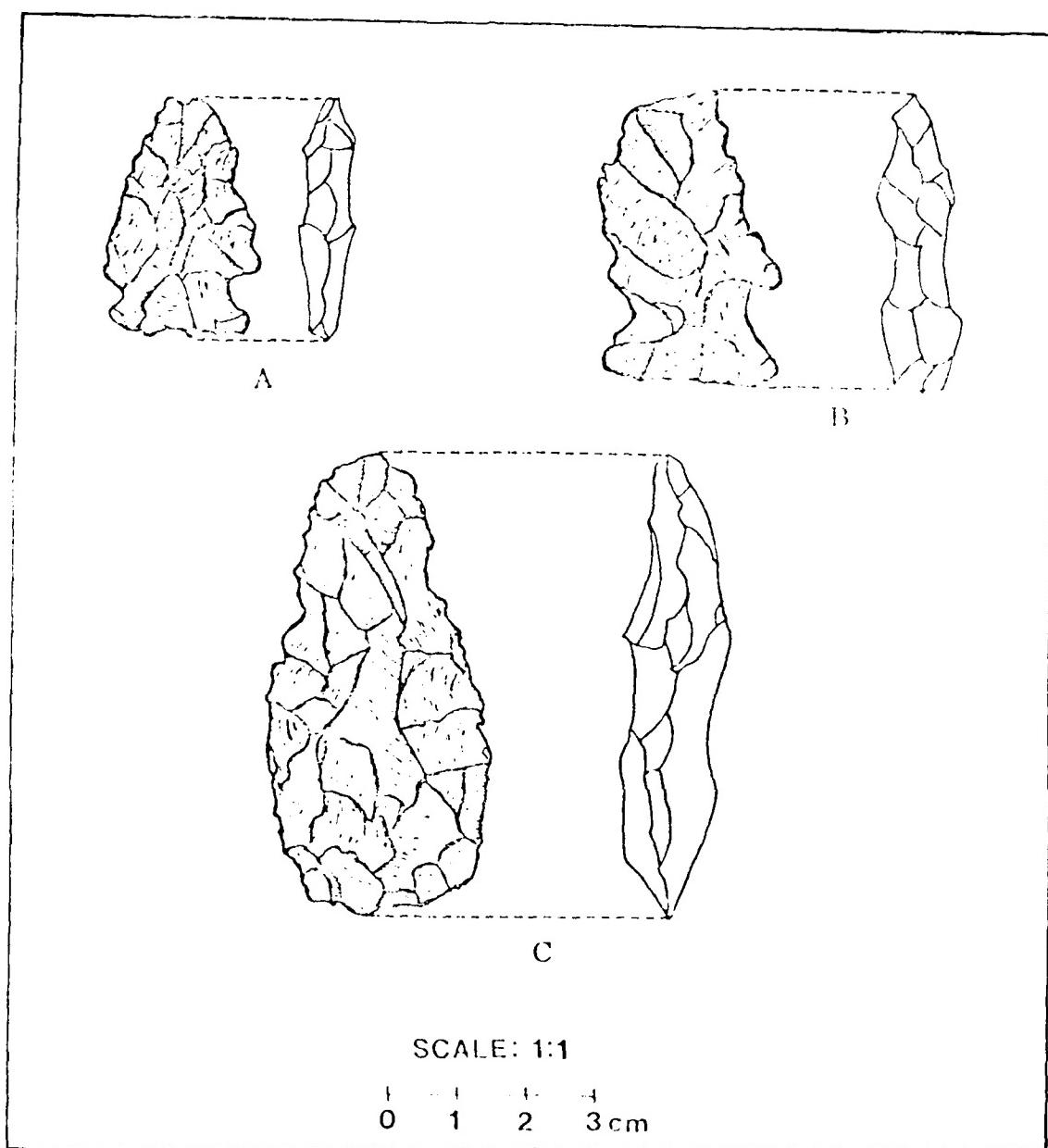


PLATE 26

Figures from 14SC15. (A) Large, expanding stemmed point. (B) Large, expanding, stemmed point. (C) Stemmed point.

and it is 8 millimeters thick. It is illustrated in Plate 27:B. The ceramics in the collection consist of four specimens of grit tempered sherd s with smooth or eroded surfaces. This type of ceramics is similar to Grasshopper Falls ware of the Plains Woodland Period.

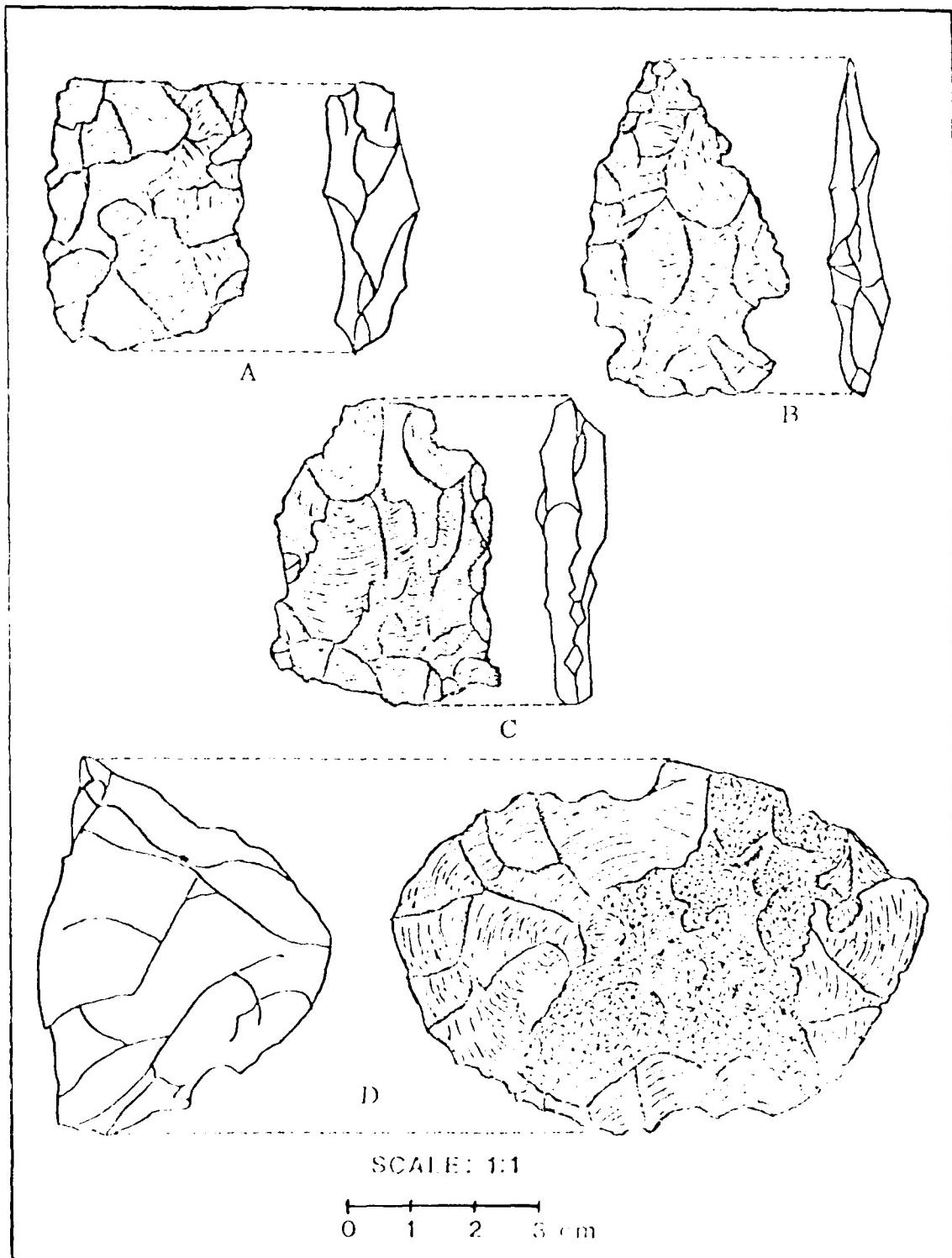


PLATE 27

Chonetes teeth from Domes. (A) Small fragments. (B) Larger, extending spine.
(C) Another fragment. (D) Large fragment.

The ceramics and diagnostic lithic artifacts suggest a general Plains Woodland occupation. Descriptively similar points (Bell 1960:34; Perino 1968:24; Marshall 1972) have been associated with the Plains Woodland Period.

14D0156

This site was identified when a light scatter of lithic material was observed on a southeast-facing terrace of Deer Creek in a cultivated field at an elevation of 271 to 274 meters (890 to 900 feet). This site is located on soils classified as Martin silty clay loam and Martin associated soils. The site area has been determined to be 1,900 square meters with maximum dimensions of roughly 70 meters north-south x 40 meters east-west.

Verification procedures for this site included placing a grid origin at the estimated center of the surface scatter, laying out north, south, east and west vectors, shovel testing these vectors at five meter intervals, and systematically collecting artifacts by quadrant. Seventeen shovel tests were conducted across the site; only one yielded a single artifact. The surface collection covered an area of approximately 3,850 square meters.

A total of 70 prehistoric lithic artifacts were recovered as a result of the surface collections and shovel tests. The artifact collection is summarized in Table 47. The collection is comprised primarily of interior flakes, 85.7%, of both common and rare color varieties. Approximately 83% of the artifacts are made of common beige, gray, pink and tan cherts. Two flake tools, two utilized flakes, one retouched flake and one unmodified blade are also among the collected artifacts. One of the flake tools is made out of a common variety of pink chert and the other is made out of rare yellow chert.

A temporal position for this site cannot be determined on the basis of the available data.

14D0157

This prehistoric site was identified in a plowed field at the base of a wooded slope along Deer Creek at an elevation of 274 to 277 meters (900 to 910 feet). A light surface scatter of lithic artifacts was observed in the field, which is situated on Vinland-Martin soils. Controlled surface collections and shovel tests indicate that the site covers a surface area of approximately 1,050 square meters, with estimated maximum dimensions of 50 meters east-west x 60 meters north-south.

When the site was revisited, its surface extent was estimated and a grid origin was established in its apparent center. The site was divided into quadrants and each quadrant was intensively collected. Approximately 3,000 square meters were examined by this method. Shovel tests were placed at five meter intervals along the cardinal axes from the grid origin until three consecutive sterile tests were encountered on each vector. This procedure confirmed the initial observation that artifact density at the site was low, as only one of 13 shovel tests yielded cultural material.

TABLE 47

INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14DO156

ARTIFACT TYPES	RAW MATERIALS								TOTAL	%
	01	02	04	06	07	08	12	14		
051	.	.	.	1	.	.	1	.	2	2.9
052	.	.	.	.	.	1	.	1	2	2.9
053	.	.	.	.	.	1	.	.	1	1.4
060	.	.	.	1	.	.	.	.	1	1.4
081	1	.	1	.	.	.	1	.	3	4.3
082	17	8	.	.	9	15	11	.	60	85.7
086	.	.	.	.	1	.	.	.	1	1.4
TOTAL	18	8	1	2	10	17	13	1	70	
%	25.7	11.4	1.4	2.9	14.3	24.3	18.6	1.4		100%

Nine artifacts were recovered from this site. The lithic assemblage includes a projectile point fragment and interior flakes. The point fragment, a mid-section, is serrated on one of its lateral edges and appears to have been triangular in form, but its fragmentary nature precludes a positive typological identification. The lithic artifacts recovered at this site are primarily made of fine grained pink and tan cherts.

An inventory of recovered materials is presented in Table 48. In addition to the lithic assemblage, one ceramic body sherd and one rim sherd were collected. The body sherd has a smooth exterior surface with rounded grit and sand temper. The rim sherd has a collared straight rim, a smooth rounded lip and grit temper. It is shown in Plate 28:C. Vertical cord marking is present below the lip and extends to the base of the collar. Straight, cord marked rims are commonly recovered from Plains Woodland sites in northeastern Kansas (Nickel 1973). Both specimens exhibit smooth interior surfaces.

TABLE 48
INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14D0157

ARTIFACT TYPES	RAW MATERIALS				TOTAL	%
	07	08	12	21		
004	1	.	.	.	1	11.1
082	.	3	3	.	6	66.6
150	.	.	.	1	1	11.1
151	.	.	.	1	1	11.1
TOTAL	1	3	3	2	9	
%	11.1	33.3	33.3	22.2		100%

The paucity of recovered artifacts may indicate that site 14D0157 represents a specialized activity area of a larger site complex, such as site 14D03. A comparison of lithic raw material types indicates a similarity to lithic artifacts recovered at site 14D03, which is located approximately 150 meters east of this site. In general, chert from both sites displays a fine texture, a resinous to waxy luster and a range of colors from beige to pink. The recovery of ceramics and a small point fragment from site 14D0157 suggests a Plains Woodland or Plains Village occupation.

14D0158

This site was identified when a light scatter of prehistoric lithic materials was observed on the edge of the Upland Prairie adjacent to the Wakarusa River and Deer Creek floodplain. The site is slightly closer to Deer Creek than to the river and borders on a wooded slope area at an elevation of 280 to 285 meters (920 to 935 feet). The soil within the site area is classified as a Gymer silt loam. The site is estimated to cover approximately 3,500 square meters with maximum dimensions of 70 meters north-south and 75 meters east-west.

Site verification procedures included the initial intensive surface walkover to determine the site boundaries, establishment of a grid origin at the approximate center of the surface scatter, execution of 1 x 1 meter rake tests on the four cardinal vectors at five meter intervals, and intensive surface collection of artifacts by quadrant. Rake tests were utilized due to the limited ground surface visibility. Thirty of these rake tests were placed on the site with three of them producing a single artifact each. Approximately 5,600 square meters were examined during the surface collection, which produced 20 artifacts.

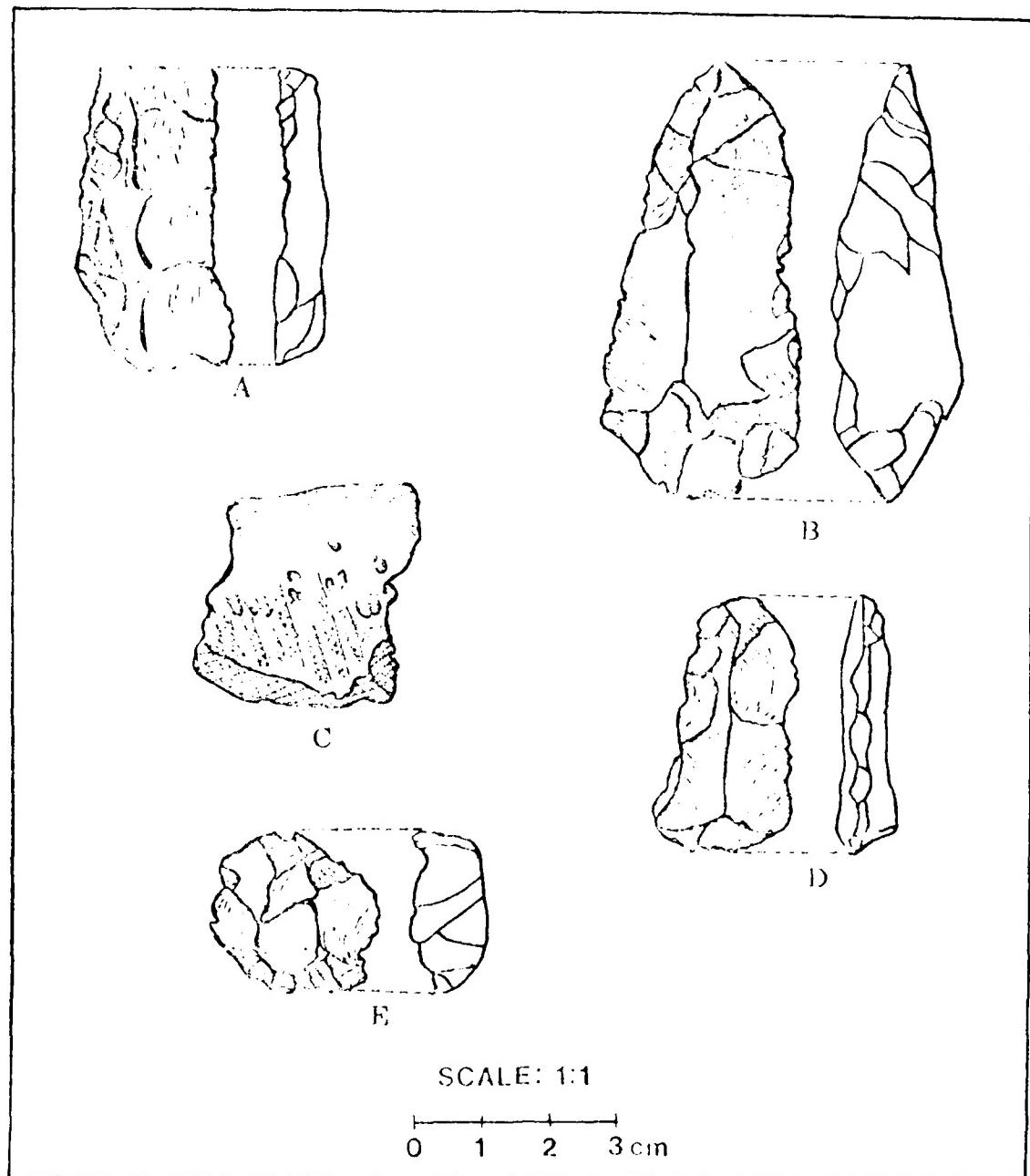


PLATE 28

Classified Stone Artifacts from 1409157, 14-B104 and 14-B105. (A) Points from 14-B104; (B) Point preferred from 14-B104; (C) Cord marked, grit tempered from 14-B104; (D) Unifacial end scraper from 14-B104; (E) Unifacial end and side scraper from 14-B105.

TABLE 49

INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14DO158

ARTIFACT TYPES	RAW MATERIALS					TOTAL	%
	01	06	07	08	10		
051	.	1	1	.	.	2	8.7
081	.	.	2	2	.	4	17.4
082	13	.	2	1	1	17	73.9
TOTAL	13	1	5	3	1	23	
%	56.5	4.3	21.7	13.1	4.3		100%

The artifacts recovered during this examination are listed in Table 49. Included in this collection are two utilized flakes of commonly occurring cream and gray cherts; four secondary decortication flakes, two of which are of gray chert and two of which are of pink chert; and interior flakes, most of common beige and gray cherts, with one pink and one red specimen. Although a large biface was observed during the initial walkover of the site, it was not recovered during the surface collection.

The lack of diagnostic artifacts in the collection such as projectile points or pottery precludes an assignment of a cultural affiliation to this site.

14DO160

This historic site consists of a pile of modern structural rubble on a terrace of the Wakarusa River. The site is at an elevation of 256 to 259 meters (840 to 850 feet) and has both Martin and Wabash silty clay soils. The site covers a surface area of approximately 75 square meters and is roughly 10 meters east-west x 8 meters north-south.

Other than the pile of remains from a small balloon frame building, there were few historic artifacts found. Artifacts discovered included bottle glass, machined nails and a door hinge. The structure appears to have been small, with unpainted wood framing. This suggests that the building was a shed rather than a residence. There is no structure indicated on the 1970 topographic map nor is there one on the 1958 U.S. Army Corps of Engineers baseline map although the latter map does show a dirt farm road running near the site. This site is probably the remains of a farm outbuilding which was razed or allowed to deteriorate prior to the development of Clinton Lake.

14DO161

This historic site is a complex of stone fences and two stone foundations along a dirt farm lane in an area of floodplain adjacent to an unnamed tributary stream of the Wakarusa River. Part of this complex extends onto the wooded slope nearby and overlooks the stream to the southwest. The site is located at an altitude of 271 to 290 meters (890 to 950 feet). The soils of the site area are classified as channeled Kennebec soils on the lower portions and Stony steep soils on the wooded slope. The site is estimated to occupy a total surface area of 10,000 square meters. The two foundations are within an area measuring roughly 50 meters north-south x 40 meters east-west.

A surface scatter of brick fragments, shotgun shells, metal hardware, automobile parts, stone, concrete, cinder blocks, bed springs and roof shingles was observed. The 1958 U.S. Army Corps of Engineers baseline map of the area shows five structures while the 1970 topographic map indicates two structures. On the basis of the observed artifacts and features, this site is believed to have been a farm complex which was razed due to the development of the Clinton Lake project.

14DO162

This historic site was discovered in a partially cultivated upland prairie overlooking Dry Creek. The site is at an elevation of 271 to 274 meters (890 to 900 feet) and is located on Oska silty clay loam. It encompasses an area of approximately 1,800 square meters, with dimensions of 60 meters east-west x 30 meters north-south.

An area enclosed by barbed wire, a dirt farm lane, a well, shade trees and a farm pond was observed in association with a surface scatter of historic artifacts including bottle glass, stone, concrete and lumber. The single structural foundation was barely discernable during the survey due to a heavy grass cover. Shovel testing in the area revealed no other historic or prehistoric artifacts. There are four structures indicated on the 1958 U.S. Army Corps of Engineers baseline map and two structures indicated on the 1970 topographic map. This appears to have been a modern residence which was razed due to the development of Clinton Lake.

14DO163

This historic site was identified on a second terrace overlooking Rock Creek at an elevation of 265 to 268 meters (870 to 880 feet). The site occupies

an area of 600 square meters and has approximate maximum dimensions of 35 meters north-south x 20 meters east-west. It is situated on channeled Kennebec soils. An inspection of the 1958 U.S. Army Corps of Engineers baseline map and 1970 topographic map revealed the presence of one structure at this location. A combined stone and concrete foundation and a wooden shed were observed as well as a light scatter of asphalt shingles, limestone, brick, corrugated tin roofing and machined nails. It appears that the site was abandoned and the structure razed as a result of the development of Clinton Lake.

14D0164

This historic site is located on a terrace adjacent to the Wakarusa River and is at an elevation of 265 to 268 meters (870 to 880 feet). Reading silt loam soils are found at this location. A surface inspection of the site suggested that the main portion of the site covers approximately 6,000 square meters. The overall dimensions are roughly 600 meters north-south x 600 meters east-west.

The site consists of a former farm complex and associated historic artifacts which include shotgun shells, glass bottles, window glass, ceramic plate and cup fragments, a bucket, pieces of clothing, rope and a 1977 Kansas license plate. The artifact assemblage indicates that domestic activities occurred at this site. A rectangular foundation of poured concrete was observed. The 1958 U.S. Army Corps of Engineers baseline map indicates eight structures at this location while the 1970 topographic map indicates only three structures. The absence of construction materials such as brick and nails suggests the possibility that these materials have been removed for new construction elsewhere.

14D0165

This site is located on a terrace at an elevation of 268 to 271 meters (880 to 890 feet) and overlooking Rock Creek to the south. It consists of a light scatter of historic artifacts and appears to be the result of domestic activity. These artifacts include glass, shotgun shells, ceramic cup fragments, tin cans, limestone rubble and a few miscellaneous metal objects. The artifact scatter has estimated maximum dimensions of 75 meters north-south x 75 meters east-west, or an areal extent of 5,625 square meters. Martin silty clay loams are present at this site.

A local resident indicated that the site was originally occupied by one of the early inhabitants of the Clinton area (Carlson, personal communication). He also informed the survey crew that an historic grave site was located nearby. A thorough inspection of the site area failed to yield any evidence of a burial such as a grave marker. Structural debris was evident at the site and it was apparent that heavy construction machinery had disturbed the area. Three structures are indicated on the 1958 U.S. Army Corps of Engineers baseline map and 1970 topographic map for this location.

14D0166

This historic site is located adjacent to an intermittent tributary stream south of Rock Creek. This location is at an elevation of 274 to 277 meters (900 to 910 feet) and exhibits channeled Kennebec soils. The site consists of a stone-lined well, exotic garden flowers and a surface scatter of artifacts including Mason jars, a stove, limestone rubble and a child's toy. The site measures roughly 110 meters north-south x 100 meters east-west. The artifact scatter covers an area of 6,000 square meters. There is no structure indicated at this location on the 1958 U.S. Army Corps of Engineers baseline map or the 1970 topographic map. However, the artifact assemblage indicates that there may have been a structure present which was razed prior to 1958.

14D0167

This historic site is at an elevation of 274 to 277 meters (900 to 910 feet). It is situated on a wooded slope near Rock Creek and surrounded by a stand of oak trees. Martin silty clay loam and Morrill clay loam soils are found at this location. A well lined with cinder blocks was discovered during the surface walkover of the site. Other historic artifacts which were observed include soda bottles, plastic jugs, a metal pot, brick, cinder blocks, wood boards and wire fence strands. The scatter of artifacts extends roughly 100 meters north-south x 100 meters east-west, for a surface area of 10,000 square meters. No structural foundations were observed. However, six structures are indicated on the 1958 U.S. Army Corps of Engineers baseline map and one structure is indicated on the 1970 topographic map at this location. The site is probably the result of the razing of these structures for the development of Clinton Lake.

14D0168

This historic site is between 280 and 283 meters (920 and 930 feet) in elevation and is located on a wooded slope above Rock Creek with Martin silty clay loam soils. A structural foundation consisting of brick and cement was the only feature observed. The foundation measures 4 x 9 meters. Although no structure is indicated on either the 1958 U.S. Army Corps of Engineers baseline map or the 1970 topographic map, the foundation may be related to a structure which was razed prior to 1958.

14D0169

This historic site is on a wooded slope above a tributary of Rock Creek and is at an elevation of 274 to 277 meters (900 to 910 feet). Vinland-Martin complex soils are present at this location. The site has dimensions of roughly 140 meters north-south x 130 meters east-west, or a surface area of 18,200 square meters.

Historic artifacts which were observed include a tractor tire, glass bottles, jars, cans, pots, a tea kettle, a ceramic Hop-A-Long Cassidy mug, a refrigerator, nails, limestone, brick, cinder block, an abandoned 1954 Chevrolet, a washing machine, a bed and a Franklin Ice Cream sign. The

artifact assemblage suggests a general mid-20th century occupation related to domestic activity. No extant structures were present although a cinder block foundation was observed adjacent to the treeline at the southern edge of the site area. A large complex of structures is indicated on the 1958 U.S. Army Corps of Engineers baseline map while only two structures are indicated on the 1970 topographic map.

14DO171

This historic site is located on the floodplain adjacent to the Wakarusa River near its confluence with a small unnamed tributary stream. The site is at an elevation of 268 to 271 meters (880 to 890 feet). It measures roughly 25 meters north-south x 25 meters east-west, an area of 625 square meters. It is situated on Reading silt loam soils.

The main features observed were a stone foundation, a well and a pile of domestic refuse. The foundation is of dressed limestone and the well is also lined with limestone. The small number of historic artifacts which were discovered included bottle glass, tin cans, machined nails, concrete, corrugated roofing metal and plumbing pipes. There is a single structure indicated for this location on the 1958 U.S. Army Corps of Engineers baseline map and the 1970 topographic map. There was evidence that the structure had been burned. It is likely that this was a domicile which was abandoned prior to the development of Clinton Lake.

14DO172

This historic site is located close to a dirt road on the left bank of the Wakarusa River and is at an elevation of 271 meters (890 feet). It is placed on Kennebec silt loam soils. The site, which is now overgrown in brush, was identified through the discovery of a concrete foundation, a stone-lined well and associated historic artifacts. The surface scatter of artifacts has maximum dimensions of 25 meters north-south x 20 meters east-west, or an area of approximately 500 square meters. The assemblage includes white earthenware, molded glass, limestone, brick, concrete, a set of bed springs and a metal bed frame. An inspection of the 1970 topographic map and the 1958 U.S. Army Corps of Engineers baseline map revealed one structure present at this location. The artifacts observed in association with the foundation indicate that this is a former domestic site.

14DO173

This historic site is located on an upland prairie at an elevation of 302 to 305 meters (990 to 1,000 feet) and is adjacent to a Douglas County road. It is situated on Pawnee clay loam soil. A surface scatter of ceramic and glass measuring roughly 50 meters north-south x 50 meters east-west, or an area of 2,500 square meters, was observed. The ceramics consisted of buff earthenware crock fragments, white earthenware fragments and a heavy scatter of white porcelain. No other historic artifacts or structural remains were observed. Two structures are indicated on the 1958 U.S. Army Corps of Engineers baseline map at this location while one structure is indicated on the 1970 topographic map.

14SH101

This prehistoric site was observed along a cultivated second terrace at an elevation of 274 meters (900 feet). It is near the confluence of an unnamed tributary stream and the Wakarusa River. The site was identified by a light to medium surface scatter of prehistoric lithic artifacts and occasional sherds located along three lobes of the second terrace. The site area measures roughly 400 meters north-south x 800 meters east-west. During controlled surface collections, artifacts were observed in an area covering approximately 23,200 square meters.

Upon return to the site for verification procedures, it was discovered that the field had been disced recently, consequently reducing the amount of visible surface material. After a heavy rain the site was again revisited, its surface extent was estimated, and a grid origin was established in the apparent center of the site. Artifact concentrations on the two western lobes were no longer readily apparent, so the grid was originated on the easternmost lobe of the site. This area was gridded into 20 x 20 meter squares for controlled surface collections. The northeast 10 x 10 meter section of each grid unit was intensively collected while artifacts were selectively collected from the remainder of the surface area. Approximately 29,500 square meters of surface area were examined by this procedure. The two lobes at the western edge of the site were not collected but were walked over to determine the extent of the site boundaries. In addition to the surface collections, 40 shovel tests at 10 meter intervals were conducted in the depressions between the terrace lobes. None of the shovel tests yielded any cultural material.

Site 14SH101 lies in an area primarily composed of Kennebec silt loam and Ladysmith silty clay loam soils and has a small area included in Broken alluvial land. The Kennebec silt loam consists of moderately well drained soil along the floodplain of the Wakarusa River and its tributaries. The Ladysmith soil is deep, moderately well drained, and formed in deposits of loess and old alluvium (USDA 1970). The soil over a large portion of the site exhibits a gray-brown color. A soil coloration change was observed at the eastern boundary of the site, where a yellow-orange sandy soil is found.

A total of 251 artifacts were recovered from this site, as shown in Table 50. The artifact assemblage includes projectile points and fragments, non-diagnostic bifaces, a drill fragment, a hammerstone, core fragments, flake tools, utilized flakes, scrapers, interior flakes, primary decortication flakes, secondary decortication flakes and retouched flakes. Some of these artifacts are illustrated in Plate 29. Prehistoric sherds and a piece of burned bone were also recovered. Burned limestone was observed but not collected. Various types of debitage account for 78.5% of the collection. The most common type of raw material found at this site is gray chert, with lesser amounts of pink and tan cherts. Some of the chert appears to have been heat-treated.

Two complete projectile points and five fragments were collected from this site. One of the complete points exhibits an expanding stem and is similar to

TABLE 3

LIBRARY OF PREHISTORIC PAINTED MATERIALS, ST. LOUIS

an Ensor point. It is illustrated in Plate 30:G. This specimen is a side notched point with a relatively straight lateral edge and a short, broad base. The base appears to have been broken and then retouched. Ensor points have been associated with the Woodland Period (Bell 1960). The other complete point, shown in Plate 30:C, is a large, stemmed point with slightly excurvate, serrated blade edges and grinding on the lateral stem edges. Large, stemmed points are characteristic of Archaic occupations in the Clinton Lake project area (Chism 1966) and are reported from Archaic contexts in north-central Kansas (Schmits 1976).

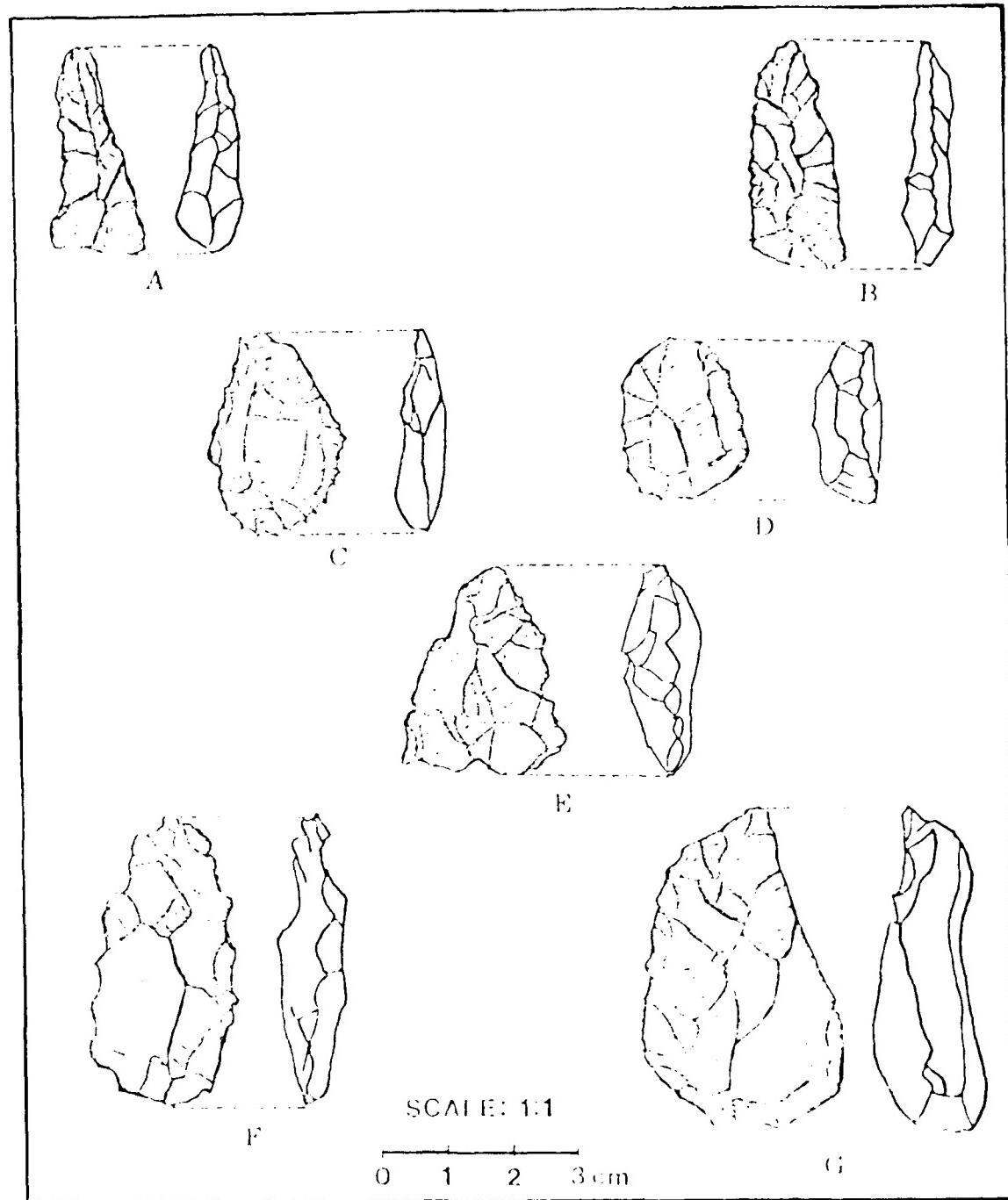


PLATE 29

Figures 1-7. Stone artifacts from the site of the ancient city of Ugarit. (A) Knapped flint; (B) flint arrowhead; (C) flint arrowhead; (D) flint arrowhead; (E) flint arrowhead; (F) flint arrowhead; (G) flint arrowhead.

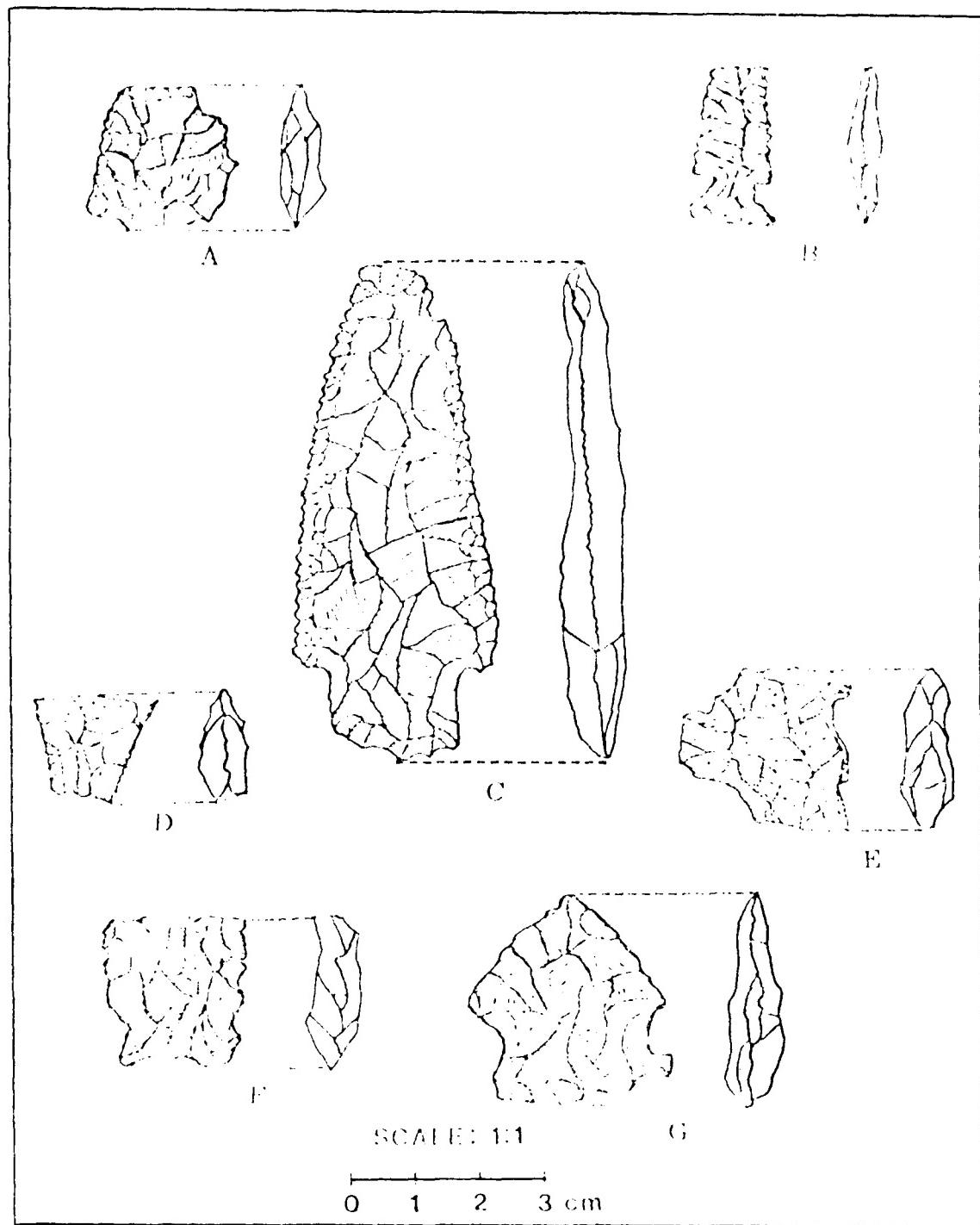


PLATE 30

Figures 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1

Of the five point fragments, only one has been assigned a typological identification. This small, corner notched point, broken below the distal end, is similar to a Scallorn point, a type primarily indicative of Plains Woodland occupations. As shown in Plate 30:B, this point is a triangular blade with serrated blade edges, corner notching and a straight to slightly excurvate basal edge. The remaining five projectile point fragments are too incomplete to identify with defined point types. The one shown in Plate 30:D appears to be the basal fragment of a lanceolate point similar to Middle or Late Archaic forms in western Missouri (Chapman 1975). The other three fragments are illustrated in Plate 30:A, E and F.

The ceramics in the collection consist of six specimens of grit tempered body sherds, two with cord marked exteriors and four with smooth or eroded exterior surfaces. All of the sherds have smooth interior surfaces. The recovered artifacts suggest that the site was occupied during the Archaic, Woodland and Plains Village Periods.

The data suggest that site 14SH101 represents a multi-component prehistoric occupation. A number of artifact concentrations were noted within the site area. The heaviest concentration was observed along the terrace edge at the eastern boundary of the site. This may indicate that the cultural deposits are buried on the terrace's former surface and are eroding out of its edge. Smaller deposits of artifacts are located on the two western lobes of the terrace.

14SH102

This site is located in the floodplain adjacent to the Wakarusa River near the base of a terrace. It was discovered in a cultivated field at an elevation of 271 to 274 meters (890 to 900 feet) in an open area approximately 120 meters west of an unnamed tributary of the Wakarusa. The site lies in an area of Wabash silty clay loam in its lower portion and an area of Reading silty clay loam at the slightly higher elevations. The site extends approximately 20 meters north-south x 30 meters east-west and covers an area of 300 square meters.

The verification crew returned to find the site had been disced so that none of the artifacts initially observed could be found. Verification was therefore delayed in order to wait for rains to wash the fields and make the artifacts visible. The site examination techniques included the establishment of a grid origin at the apparent center of the surface scatter, placement of shovel tests along the cardinal vectors at five meter intervals, and surface collection by quadrants. Thirteen shovel tests were conducted across the site with none yielding artifacts. Examination procedures covered 3,600 square meters. Eight artifacts, summarized in Table 51, were recovered. A biface fragment of gray chert, a utilized flake of gray chert, five interior flakes of local gray and cream cherts, and a retouched flake of cream chert comprise this collection.

The temporal position of the site cannot be determined from the presently available data.

TABLE 51

INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14SH102

ARTIFACT TYPES	RAW MATERIALS		TOTAL	%
	06	07		
028	.	1	1	12.5
051	.	1	1	12.5
053	1	.	1	12.5
082	1	4	5	62.5
TOTAL	2	6	8	
%	25.0	75.0		100%

14SH103

This prehistoric site was discovered on the Wakarusa River floodplain in a cultivated field adjacent to a relict river channel. The site is at an elevation of 274 to 277 meters (900 to 910 feet) and is situated on Reading silty clay loam soils. A surface scatter of prehistoric lithic and ceramic artifacts was observed in the cultivated field. The observed artifacts primarily consisted of lithic flakes and a few scrapers, bifaces, hammerstones and grit tempered ceramics. A projectile point was collected during the initial discovery of the site. The site measures roughly 85 meters north-south x 100 meters east-west and covers 6,875 square meters. Subsequent mapping of the site location indicated that the site was bisected by an "Indian Trail" (Iroquois Research Institute 1977:Plate 115) shown on an 1857 map of the Richland, Kansas area.

The northern portion of the site had been disced before the verification crew returned, which resulted in decreased visibility of surface artifacts. The surface extent of the site was estimated and a grid origin was placed in the

TABLE S7
INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14SH103

ARTIFACT TYPES	RAW MATERIALS												TOTAL	%
	C1	C3	C6	C7	C8	C9	C10	C12	C13	C15	C19	C21		
001					1								1	0.7
006													1	0.7
017						1							1	0.7
018													1	0.7
023									1				1	0.7
026					1								2	1.4
034					2								2	1.4
046					1								1	0.7
057					2					1			3	2.0
044					1					1			2	1.4
051					3				1	3	1		5	5.5
055					1								1	0.7
070					1								1	0.7
085					10	1			2				13	8.9
081	19	2	2	39	16	2	4	16	2				102	69.5
171										3			3	2.0
151											3		3	2.0
TOTAL	10	2	2	63	18	2	4	21	7	1	3	3	146	
%	13.7	1.4	1.4	43.1	12.3	1.4	2.7	14.4	4.8	0.7	2.0	2.0	100%	

apparent center of the site. Cardinal vectors were extended from the grid origin, creating quadrants for controlled surface collections. Within each quadrant, 20 x 20 meter squares were laid out. The northeast 10 x 10 meter section of each grid unit was intensively collected while artifacts were selectively collected from the remainder of the surface area. Approximately 7,600 square meters of surface area were examined by this procedure.

Nineteen shovel tests were conducted along the vectors at five meter intervals on the west vector and 10 meter intervals on the remaining three vectors. All of the shovel tests proved negative except for one flake recovered at 35 meters from grid origin on the west vector.

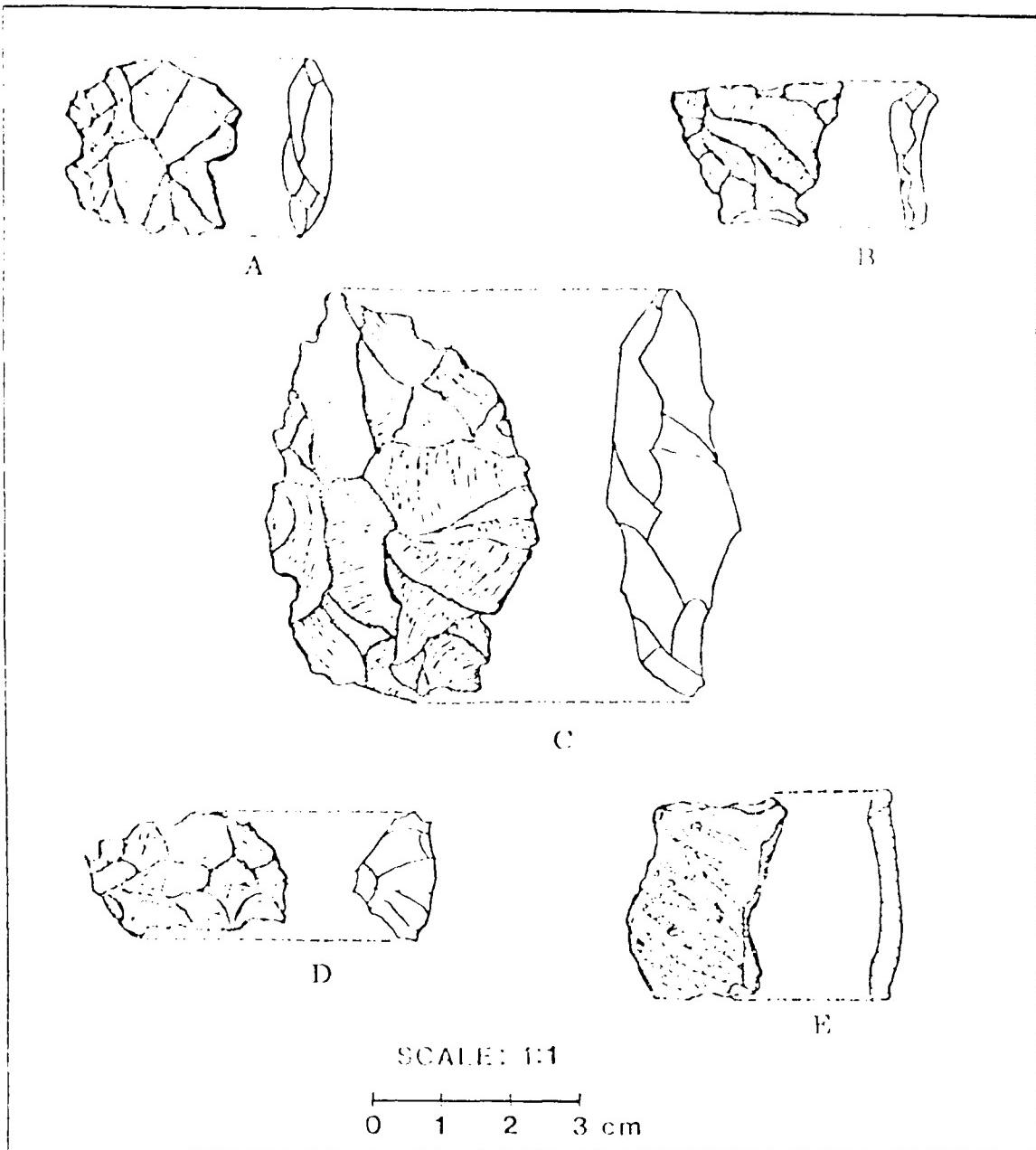


PLATE 31

Archaeological Artifacts from 14SH103. (A) Irregular biface. (B) Small bifaces. (C) Two bifaces. (D) Two small bifaces. (E) A larger biface, possibly a modified point.

A total of 145 artifacts were recovered from the controlled surface collections at site 14SH103 in addition to the point collected when the site was discovered. The artifact assemblage includes a modified point, bifaces and

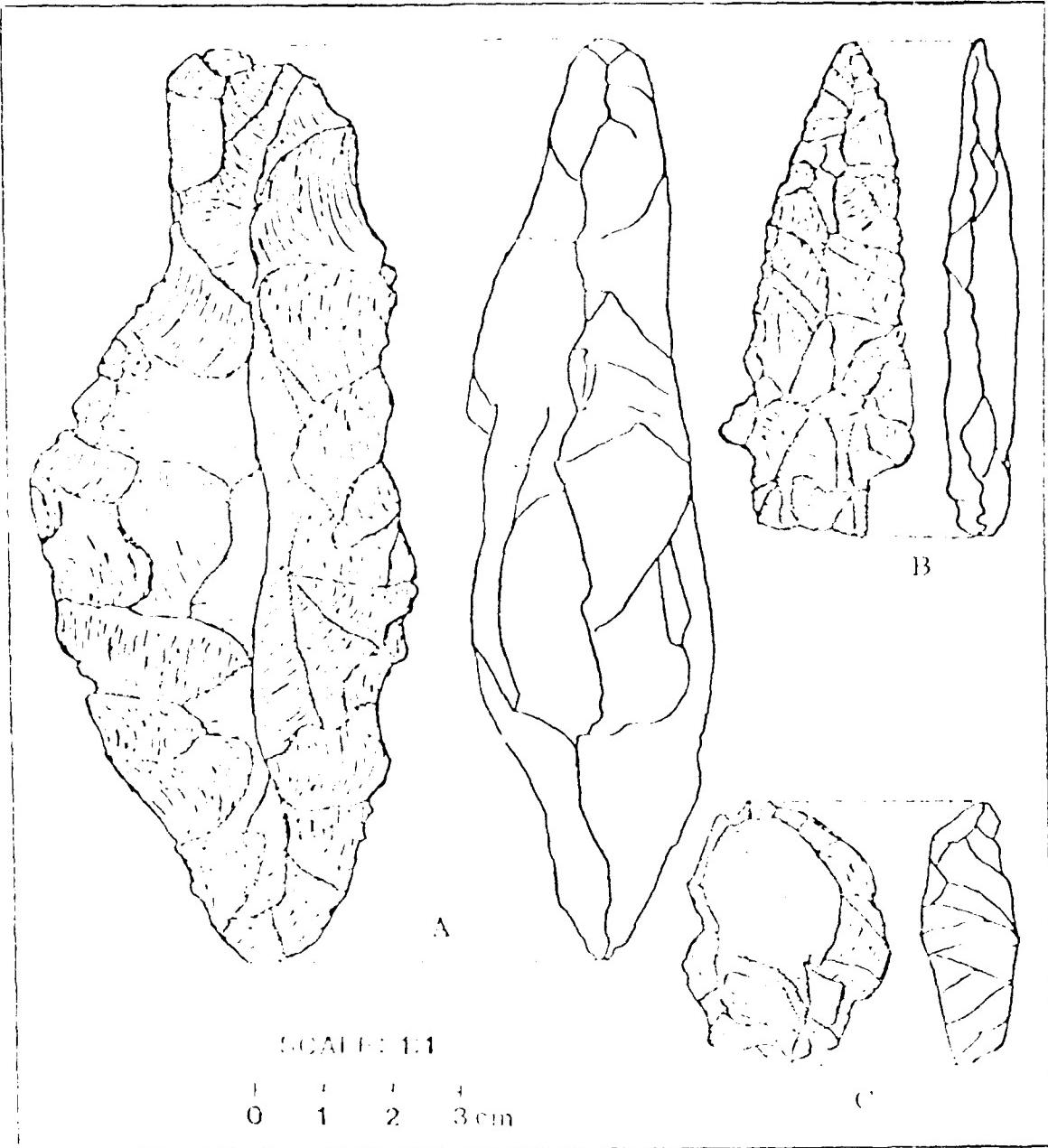


PLATE 2

biface fragments, end and side scrapers, hammerstones, utilized flakes, a polyhedral blade core, secondary decortication flakes, interior flakes and sherds. Some of these artifacts are illustrated in Plate 31:A, B and D and Plate 32:A and C. The lithic raw materials consist principally of gray, tan and beige cherts, as shown in Table 52. These cherts are commonly found at sites along the Wakarusa River within the project area.

The recovered hammerstones are river-worn cobbles of well cemented sandstone that have been subjected to heavy battering. The complete projectile point, illustrated in Plate 32:B, has not been assigned a positive typological identification. Made from fossiliferous gray chert, it is biconvex in cross section and has a straight, contracting stemmed base, rounded shoulders and irregularly serrated lateral edges. Similar forms occur in Archaic horizons at the Coffey site in north-central Kansas (Schmits 1976). Three angular grit tempered body sherds with smooth or eroded exterior surfaces were also recovered. These sherds are similar to Grasshopper Falls ware of the Plains Woodland Period. One is illustrated in Plate 31:E.

It is possible that this site is associated with the "Indian Trail" which was known by the early Euro-American settlers of the Wakarusa Valley (Iroquois Research Institute 1977:Plate 115). The site is also one of the few sites in the project area which were discovered on the Wakarusa River floodplain.

14SH104

This site was identified in a cultivated field when a light scatter of prehistoric lithics and faunal material was observed on the floodplain of the Wakarusa River adjacent to a relict river channel. The site is at an elevation between 271 and 274 meters (890 and 900 feet). The areal extent of the site is estimated to be 3,875 square meters with maximum dimensions of 90 meters north-south and 60 meters east-west.

The verification procedures for this site included an intensive walkover of the area to determine the boundaries of the site, establishment of a grid origin point at the approximate center of the surface scatter, shovel testing on the four cardinal vectors at five meter intervals, and systematic collection of artifacts by quadrant. There were 28 shovel tests conducted across the site, all with negative results. An area of 6,200 square meters was examined. Twenty-four artifacts were recovered, but none of these were diagnostic. The assemblage is summarized in Table 53. Twenty bone fragments were also collected. They were too fragmentary to identify although one large, thick fragment is possibly from a cow or a buffalo.

This site along with the others along this segment of the Wakarusa River is located on Reading silty clay loam. This soil is typical in locations along the banks of the river near its confluence with a stream flowing in a relict channel of the river. No soil changes, features or artifacts were observed during a cut-bank inspection of the site.

The artifacts recovered from this site include a point preform of cream chert, a large cream chert biface, an end scraper of gray chert, a flake tool of

TABLE 53

INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14SH104

ARTIFACT TYPES	RAW MATERIALS						TOTAL	%
	01	06	07	08	09	12		
009	.	1	.	.	.	.	1	4.2
026	.	1	.	.	.	.	1	4.2
046	.	.	1	.	.	.	1	4.2
051	.	.	.	1	.	.	1	4.2
052	.	.	.	.	1	.	1	4.2
080	2	.	.	.	.	.	2	8.3
081	.	.	1	.	.	1	2	8.3
082	7	2	6	.	.	.	15	62.5
TOTAL	9	4	8	1	1	1	24	
%	37.5	16.6	33.3	4.2	4.2	4.2		100%

purple chert, a utilized flake of pink chert, two primary decortication flakes of beige chert and two secondary decortication flakes of gray and tan cherts. No diagnostic artifacts were recovered. The preform, biface and end scraper are shown in Plate 28:A, B and D. Fifteen interior flakes of beige, gray and cream cherts were also found.

This site may be associated with two other prehistoric sites, 14SH103 and 14SH105, which are nearby and possess similar assemblages. All three sites may

be associated with an 1857 Indian Trail (Iroquois Research Institute 1977:Plate 115) which passes through the area and appears to pass directly by 14SH103.

14SH105

This site was identified when a light scatter of prehistoric artifacts was observed along the edge of a cultivated field on the floodplain of the Wakarusa River. The site is at an elevation between 274 and 277 meters (900 to 910 feet). The site area is estimated to be approximately 1,050 square meters with maximum dimensions of 30 meters north-south x 45 meters east-west.

Verification of this site was complicated by its position along the northern edge of a cultivated field and its extension into a grassy area along an intermittent stream to the north. Like the other sites in this area, it is located on soils classified as Reading silty clay loam. Verification of the site included a walkover of the area to determine the surface extent of the site, establishment of a grid origin at the east-west center of the site along the edge of the cultivated field, shovel testing of the east, west and south vectors at five meter intervals, rake testing at five meter intervals along the north vector, and rake testing of the northwest and northeast quadrants. Stream banks were also inspected with negative results. The rake tests conducted in the northern half of the area and the 18 shovel tests conducted at the site all failed to yield artifacts.

The surface examination of the site covered an area of 4,200 square meters. Twenty-one artifacts were recovered from the surface collection of the site and are listed in Table 54. One side scraper, one side and end scraper shown in Plate 28:E, one utilized flake and one secondary decortication flake, all made from common gray chert, were recovered. The remaining artifacts are mostly interior flakes of beige and gray cherts. A single polyhedral blade core of beige chert is also present in the collection.

The limited data available at present preclude assigning a temporal position to this site.

14SH106

This historic site is located on a terrace along Camp Creek near its confluence with the Wakarusa River at an elevation of 277 to 287 meters (910 to 940 feet). The site measures roughly 50 meters north-south x 50 meters east-west, or an area of 2,500 square meters. It is situated on Martin silty clay loam soils. The poorly preserved foundations of five structures were present, as well as a scatter of glass, ceramics, brick, stone and bone. Six structures are indicated on the 1958 U.S. Army Corps of Engineers baseline map while only two are shown on the 1970 topographic map. The site appears to be the remains of a modern farm complex which was abandoned due to the development of Clinton Lake.

14SH107

This site consists of a surface scatter of historic cultural debris and structural remains at an elevation of 277 to 280 meters (910 to 920 feet). Its dimensions are roughly 80 meters north-south x 90 meters east-west, for a total

TABLE 54

INVENTORY OF PREHISTORIC RECOVERED MATERIALS, SITE 14SH105

ARTIFACT TYPES	RAW MATERIALS			TOTAL	%
	01	07	08		
047	.	1	.	1	4.8
049	.	1	.	1	4.8
051	.	1	.	1	4.8
070	1	.	.	1	4.8
081	.	1	.	1	4.8
082	9	6	1	16	76.1
TOTAL	10	10	1	21	
%	47.6	47.6	4.8		100%

area of 7,200 square meters. It is located on a second terrace slope along the left bank of the Wakarusa River on Martin silty clay loam soils.

Major features of the site include a concrete foundation and a stone wall. Concrete and limestone rubble surround the foundation. The stone wall consists of coursed rubble construction utilizing locally available limestone. It extends along the western and northern boundaries of the site. Artifacts observed on the surface include construction hardware such as bolts, screws, clay piping, wood siding, asbestos shingles, drain gutters, metal roofing materials, machined nails and window glass, as well as ceramic cup fragments, cosmetic jars, a rubber sandal, an oil filter, herbicide cans, Mason jars, and steel and aluminum beverage cans. Six structures are indicated at this

location on the 1958 U.S. Army Corps of Engineers baseline map and one is indicated on the 1970 map. The artifacts indicate that this is a former domestic site.

14SH108

This historic site is a complex of structural remains and an associated historic artifact scatter that is located on Martin silty clay loam soils north of a Shawnee County road. It is located on a wooded slope at an elevation of 274 to 287 meters (900 to 940 feet), covering a surface area of approximately 12,800 square meters.

The 1958 U.S. Army Corps of Engineers baseline map indicates six structures and the 1970 topographic map indicates three structures for this location. Only four structural foundations were clearly discerned, but the extent of the surface scatter and soil disturbance did indicate that other structures had been present.

One foundation, which appears to be the remains of the largest building, consists of a scatter of dressed limestone blocks and brick fragments. Apparently this structure was burned, as burned limestone and large pieces of charcoal were observed in the structural debris. Two stone foundations of smaller structures are situated to the north of the largest building foundation. One foundation is comprised of covered rubble limestone while the other is a foundation of covered ashlar masonry. These two foundations appear to be remnants of structures used as sheds or storage areas. The fourth foundation, that of a silo, is also constructed of rubble limestone. There is a cistern located just to the west of the largest building foundation. The artifact assemblage suggests a general mid-20th century occupation and is representative of a domestic site.

14SH109

This historic site is adjacent to a cultivated field along the left bank of the Wakarusa River at an elevation of 274 to 276 meters (900 to 905 feet). The site dimensions are roughly 100 meters north-south x 100 meters east-west, or a surface area of approximately 10,000 square meters. The site is situated on Reading silty clay loam soils.

Historic artifacts observed include brick, wood beams, a glass bottle, concrete, one piece of farm machinery and earthenware fragments. The site area has been disturbed by heavy machinery, as evidenced by tractor tire impressions on the ground surface. No structural foundations were observed. A refuse area located to the west along the Wakarusa River appears to be associated with the occupation of this site. The refuse included various types of glass, cans, and an abandoned automobile, a 1958 Chrysler. The 1958 U.S. Army Corps of Engineers baseline map indicates the presence of five structures at this location and the 1970 topographic map indicates two structures. The site was probably a domestic farm complex razed in connection with Clinton Lake construction activities.

14SH110

This historic site is located on the right bank of the Wakarusa River floodplain in close proximity to the Missouri-Pacific railroad tracks. It is at an elevation of 274 to 277 meters (900 to 910 feet). The site, located on Reading silty clay loam soil, is characterized by a light scatter of historic artifacts covering a surface area of approximately 2,500 square meters, with dimensions of 50 meters north-south x 100 meters east-west. Most of the artifacts observed were porcelain, including some exhibiting various types of transfer printing. Also observed were various types of molded glass and small amounts of red brick.

The site was revisited after initial observations in order to recover a representative sample of the artifact types. It was felt that the artifacts might represent a relatively early historic occupation of the Wakarusa River Valley. Upon revisiting the site it was discovered that the field had been recently disced for spring planting, which resulted in decreased surface artifact finds. However, a careful inspection of the site yielded a number of ceramic fragments, including one fragment with a brown transfer print. Although the ceramics are not precisely diagnostic they suggest that the site may have been occupied as early as the 1920's. The 1958 U.S. Army Corps of Engineers baseline map and 1970 topographic map do not reveal a structure at this location. Therefore, it seems likely that the site was abandoned and any structures were razed prior to 1958.

14SH111

This historic site is situated along a second terrace above an intermittent stream at an elevation of 274 to 277 meters (900 to 910 feet). The site is located on Martin silty clay loam and Ladysmith silty clay loam soils and covers an area of approximately 21,960 square meters. The scatter of historic artifacts observed during a surface inspection included glass, brick, concrete, machined nails, asbestos shingles and automobile tires.

Structural foundations and artifact concentrations present suggest the remains of at least six structures. Three concrete foundations and one limestone foundation of a silo are included within the project boundaries. Four abandoned buildings, three wood frame sheds, and one limestone and wood frame shed appear to be associated with the site but are located to the west and outside of the project boundary. No foundation of the main house was in evidence. This suggests that this structure was moved, either in whole or in part, to another location. An inscription found at the base of the silo reads: "Francis Anderson April 29, 1944," indicating that the site was utilized as early as that date. The 1958 U.S. Army Corps of Engineers baseline map shows 10 structures at this location while the 1970 topographic map indicates three structures. The site appears to have been a domestic farm complex that was partially razed due to the development of Clinton Lake.

Prehistoric Summary and Discussion

Archaeological material recovered from the sites tested and surveyed during the 1978-1979 project indicates the presence of Archaic, Plains Woodland and Plains Village Period components. In addition, the fluted point recovered during the 1976 survey at 14DO137 indicates the possible presence of late Paleo-Indian occupations in the reservoir area as well.

There are a number of cultural and natural factors that affect the archaeological record, including surface visibility, previous collecting, erosion and soil chemistry, and deposition. The conclusions in this report are obviously affected by these conditions.

Presumably diagnostic projectile point styles and scattered ceramics have been used to determine the cultural components represented at sites in the project area. Unfortunately, many point styles are relatively poor diagnostic tools, and in the absence of an adequate sample of ceramics or specifically diagnostic points, it is impossible to assign many assemblages to particular periods or phases. This problem is particularly acute with regard to many of the large point types recovered during the testing and survey, since a wide variety of large, stemmed and corner notched point forms occur in both Archaic and Plains Woodland contexts.

Among the prehistoric sites tested in 1978-1979, information was completely lacking from either the 1978-1979 project or the 1976 survey (Iroquois Research Institute 1977) to allow the temporal or cultural placement of nine assemblages: 14DO126, 14DO129, 14DO131, 14DO134, 14DO140, 14DO145, 14DO148, 14DO309 and 14DO310. In addition, survey data were lacking to permit the temporal-cultural placement of five discovered sites: 14DO156, 15DO158, 14SH102, 14SH104 and 14SH105.

With the exception of the Clovis-like fluted point recovered on the surface of 14DO137, evidence of prehistoric occupation predating the Archaic Period is lacking in the Clinton Lake area. In much of the eastern Plains, evidence of possible Paleo-Indian occupations is limited to the scattered occurrence of Llano, Folsom or Plano series points on the surface. A few late Paleo-Indian and early Archaic kill sites do occur in the eastern and Central Plains, however, for example, in southern Nebraska and western Iowa (Jennings 1974; Caldwell and Henning 1978). Testing at 14DO137 failed to offer any confirmation for the existence of a Paleo-Indian component at the site.

Based upon the occurrence of presumed diagnostic artifact styles recovered during the 1978-1979 testing program and the earlier 1976 survey (Iroquois Research Institute 1977), possible Archaic components are present at five tested sites: 14DO127, 14DO128, 14DO133, 14DO144 and 14DO154. Sites 14DO128, 14DO144 and 14DO154 appear to represent multi-component assemblages, however, and it is possible that a definable Archaic component may not be present at these locations. At 14DO128 and 14DO154, in particular, none of the large points present are especially diagnostic of the Archaic Period; these points may in fact be related to Plains Woodland occupations.

An Archaic component is also apparently present at 14SH101, one of the sites discovered during the 1979 survey program. At this site, as at 14DO133,

a fragment of a lanceolate point reminiscent of the Rice Lanceolate, Nebo Hill and Sedalia type complex (Chapman 1975) was recovered. Based upon recent research in the Nebo Hill area (Reid 1980), it is possible that these points at 14SH101 and 14D0133 represent late Archaic occupations equivalent to those in the Kansas City area (*Ibid.*) and Hillsdale Lake (Blakeslee, personal communication). Comparative dates from Nebo Hill (Reid 1980) would suggest a date of about 1600 B.C. for the lanceolate points in Clinton Reservoir. Other points recovered from 14SH101 and 14SH103 are suggestive of Archaic point styles reported from north-central Kansas (Schmits 1976).

In view of the general lack of ceramics from the sites tested and surveyed in 1978-1979, the recognition of Plains Woodland components is difficult. Nevertheless, potential Plains Woodland occupations are recognized at seven of the sites tested in 1978-1979 and at four of the newly discovered sites. For the most part, these identifications are made on the basis of the presence of small, corner notched projectile points and several varieties of large, expanding stemmed points. Possible Plains Woodland ceramics were recovered from the surface of one tested site and four sites discovered in the 1979 survey.

Small, corner notched points, usually within the range of variation attributable to Scallorn points (Bell 1958), are probably representative of Plains Woodland occupations at 14D03 and 14SH101. Other small, corner notched or stemmed points were recovered at 14D0132 and 14D0135.

In addition to small points, possible Plains Woodland occupations in the project area are represented by a variety of large, expanding stemmed, convex based points recovered in 1976 (Iroquois Research Institute 1977) or during the 1978-1979 project at 14D0128, 14D0130, 14D0135, 14D0144, 14D0154, 14D0155 and 14SH101. Most of these points fall within the range of variation attributed to the Williams, Ellis and Ensor types reported from the Elk City Reservoir in southeastern Kansas (Marshall 1972). Large, expanding stemmed points are not uniquely Plains Woodland, however, and it is possible that several of these artifacts indicate Archaic Period occupations.

Ceramics recovered from 14D0154, 14D0155, 14D0157, 14SH101 and 14SH103 are probably reflective of Plains Woodland occupations, although similar ceramics occur less frequently in transitional Plains Woodland-Plains Village or Plains Village complexes such as the Clinton phase (Johnson 1968). Most of the pottery falls within the range of variation reported for Grasshopper Falls ware of the Plains Woodland Period (Reynolds 1979a). These sherds are typically composed of an angular grit tempered paste and exhibit cord marked exterior surfaces. Several sherds of identical paste appear to exhibit smoothed or eroded surfaces.

Based upon the limited amount of data recovered during the 1978-1979 project, as well as in 1976 (Iroquois Research Institute 1977), it may be tentatively suggested that those Plains Woodland sites lacking small projectile points can be identified with the Wakarusa phase, as defined by Johnson (1968) for the Clinton Lake area. This would include sites 14D0128, 14D0130, 14D0144, 14D0154 and 14D0155.

The Deer Creek phase (*Ibid.*), which possibly postdates the Wakarusa phase slightly, is characterized by the introduction of small, corner notched points, as well as by exhibiting slight evidence of marginal contacts with Middle Woodland groups to the northeast. Deer Creek phase occupations may be tentatively assigned to sites 14D03, 14SH101 and 14D0132, based upon the presence of small, corner notched points in the assemblages.

Plains Village Period occupations are represented in the tested and surveyed sites by the presence of small, side notched or unnotched projectile points, and shell or clay tempered pottery. Using these criteria, Plains Village Period components may be identified at 14D03, 14D0144 and 14D0154. The Plains Village component at 14D03 is represented by a small, unnotched point, and possibly by ceramics recovered by Johnson (1968). The component at 14D0154 is indicated by a small, side notched point discovered in 1976 (Iroquois Research Institute 1977). The presence of clay tempered pottery at 14D0144, in addition to two small, unnotched points, offers firm evidence for a Plains Village Period component at that site.

These three Plains Village components may be identified with the Clinton phase (Johnson 1968), which has been defined for the Clinton Lake vicinity. The Clinton phase shows similarities to the Pomona focus, widespread in many portions of eastern Kansas (Witty 1967; Marshall 1972).

Together, the Clinton phase and the Pomona focus may represent local, somewhat atypical manifestations of the Central Plains tradition (Caldwell and Henning 1978), or a transitional Plains Woodland - Plains Village complex that endured well into the Plains Village Period in eastern Kansas (Marshall 1972).

The assemblages from the test excavated sites consist primarily of materials related to lithic manufacturing activity. Cores anddebitage account for approximately 82% of the systematic sample of the tested sites' assemblages. The assemblages of the surveyed sites also contain a high percentage of material related to tool manufacturing; roughly 85% of the surveyed sites' systematic assemblages consists of cores anddebitage. In addition to lithic debitage and cores, the presence of possible cutting and scraping tools, ceramics and projectile points at both tested and surveyed sites attests to a wider range of cultural activities. The artifacts recovered during the testing and survey programs are presented in Tables 55, 56, 57 and 58.

Evidence of structures, burials and other large subsurface features was not apparent at the sites tested during the 1978-1979 project. Only a few possible small cultural features were identified. An intact hearth was discovered at a depth of 17 centimeters at 14D0154. This feature yielded radiocarbon determinations of 840 ± 150 years B.P. and 1040 ± 150 years B.P. (Krueger 1980). These determinations would appear to place the feature in a transitional late Plains Woodland - early Plains Village time range, and may be consistent with the presence of a Clinton phase occupation at the site. A possible hearth was also observed at 14D0131, based upon the presence of a dark soil stain in association with burnt limestone.

TABLE 55

INVENTORY OF PREHISTORIC ARTIFACT COLLECTIONS: 1978-1979 TESTING PROGRAM
SYSTEMATIC EXCAVATED SAMPLE

SITE NUMBER	ARTIFACT CATEGORIES							TOTAL
	BIFACES	UNIFACE-FLAKES	UNIFACE-BLADES	CORES	DEBITAGE	OTHER	CERAMICS	
14D03	4	6	1	0	172	0	0	183
14D0126	0	25	3	0	31	0	0	59
14D0127	0	1	0	0	11	0	0	12
14D0128	2	157	3	5	461	0	0	628
14D0129	0	31	0	0	101	0	0	132
14D0130	0	2	0	0	17	0	0	19
14D0131	0	23	0	1	50	0	0	74
14D0132	0	1	0	0	3	0	0	4
14D0133	1	4	0	0	8	0	0	13
14D0134	1	34	0	0	80	0	0	115
14D0135	3	15	0	1	162	0	0	181
14D0137	0	31	1	0	384	0	0	416
14D0140	3	111	2	181	356	0	0	653
14D0144	0	10	1	0	124	1	0	136
14D0145	0	3	0	0	39	0	0	42
14D0148	1	2	0	0	32	0	0	35
14D0154	0	22	0	2	119	0	0	143
14D0309	0	58	0	3	184	0	0	245
14D0310	0	0	1	1	132	1	0	135
TOTAL	15	536	12	194	2,466	2	0	3,225

TABLE 56

INVENTORY OF PREHISTORIC ARTIFACT COLLECTIONS: 1978-1979 TESTING PROGRAM
SELECTIVE SURFACE SAMPLE

SITE NUMBER	ARTIFACT CATEGORIES						CERAMICS	TOTAL
	BIFACES	UNIFACE-FLAKES	UNIFACE-BLADES	CORES	DEBITAGE	OTHER		
14D03	12	8	2	0	3	0	0	25
14D0126	0	0	0	0	0	0	0	0
14D0127	1	0	0	0	0	0	0	1
14D0128	5	0	0	0	0	0	0	5
14D0129	0	0	0	0	0	0	0	0
14D0130	0	0	0	0	0	0	0	0
14D0131	0	0	0	0	0	0	0	0
14D0132	1	0	0	0	0	0	0	1
14D0133	1	0	0	0	0	0	0	1
14D0134	0	0	0	0	0	0	0	0
14D0135	5	1	0	0	0	0	0	6
14D0137	2	6	0	1	8	0	0	17
14D0140	1	3	1	0	7	0	0	12
14D0144	12	5	1	0	6	1	2	27
14D0145	1	0	0	0	0	0	0	1
14D0148	0	0	0	0	0	0	0	0
14D0154	12	3	1	0	0	0	0	16
14D0309	0	0	0	0	0	0	0	0
14D0310	0	0	0	0	0	0	0	0
TOTAL	53	26	5	1	24	1	2	112

TABLE 57

INVENTORY OF PREHISTORIC ARTIFACT COLLECTIONS: 1979 SURVEY PROGRAM
SYSTEMATIC SURFACE SAMPLE

SITE NUMBER	BIFACES	UNIFACE-FLAKES	UNIFACE-BLADES	ARTIFACT CATEGORIES				CERAMICS	TOTAL
				CORES	BRITAGE	OTHER			
14D0155	3	15	0	0	90	0	2	110	
14D0156	0	5	1	0	64	0	0	70	
14D0157	1	0	0	0	6	0	2	9	
14D0158	0	2	0	0	21	0	0	23	
14SH101	10	17	0	1	185	0	3	216	
14SH102	1	2	0	0	5	0	0	8	
14SH103	4	13	0	1	115	0	0	133	
14SH104	2	3	0	0	19	0	0	24	
14SH105	0	3	0	1	17	0	0	21	
TOTAL	21	60	1	3	522	0	7	614	

In the general absence of cultural features, the determination of site function is difficult. This task is made more difficult, given the limitations upon the range of artifact analysis possible under the scope of the current contract. Consequently, any hypotheses of site function based upon the data at hand must of necessity be limited in scope. Hypothesized functions of the sites tested in 1978 are discussed below.

TABLE 58

INVENTORY OF PREHISTORIC ARTIFACT COLLECTIONS: 1979 SURVEY PROGRAM
SELECTIVE SURFACE SAMPLE

SITE NUMBER	ARTIFACT CATEGORIES							CERAMICS	TOTAL
	BIFACES	UNIFACE-FLAKES	UNIFACE-BLADES	CORES	DEBITAGE	OTHER			
14DO155	8	0	0	1	0	0		2	11
14SH101	8	9	0	2	11	1		3	34
14SH103	5	2	0	0	0	3		3	13
TOTAL	21	11	0	3	11	4		8	58

14D03. Covering an area of 15,000 square meters, 14D03 is a relatively large site. In addition, an extremely high density of artifacts characterized the excavated test pits. Roughly 187 artifacts were recovered per cubic meter excavated. With one exception, this is the highest figure reported from the tested sites. On the basis of size and apparent intensity of occupation, it may be suggested that 14D03 represents a relatively large, and possibly semi-permanent or seasonally revisited settlement. The site is situated near 14D015⁴ and 14D0157, and all three sites are apparently late Plains Woodland or Plains Village Period settlements. It is possible that these three sites are functionally related components of a larger settlement.

Somewhat surprisingly, in view of the above hypothesis, no ceramics were recovered from either the test pits or from the surface at 14D03 in 1978. Additionally, about 94% of the excavated assemblage recovered at the site consists solely of unmodified debitage. It is of course possible that detailed microscopic analysis of the debitage would indicate a high proportion of tools in the assemblage. It may be, however, that the areas tested were primarily tool manufacturing locales. It is known that ceramics were recovered from

14D03 during earlier investigations (Chism 1966; Johnson 1968; Ziegler, personal communication). This may suggest that activities were spatially organized at 14D03, offering some support for an hypothesis that the site represents a relatively large and complex settlement.

14D0126. This is a relatively large site located on an upland prairie and covering some 20,000 square meters. Although the overall density of artifacts is low at 14D0126, over 42% of the artifact assemblage consists of utilized flakes, flake tools and retouched flakes. The presence of a high proportion of these items suggests that hide working, butchering, and other cutting and scraping activities may have been comparatively significant at 14D0126. Within the debitage categories, secondary decortication flakes and interior flakes are much less numerous than primary decortication flakes and unspecific lithic shatter, suggesting that the site may not have been a locus of finished tool manufacture. In view of the low artifact density in the tested area, the site is probably not a major settlement, in spite of its large size.

14D0127. Little can be said concerning this site in view of the small number of artifacts recovered during the subsurface testing. With an area of only 7,500 square meters, the site is quite small and the density of artifacts is also low. Presumably the site represents some form of temporary special activity area; it is possibly only a small chipping station. Little else can be hypothesized from the data at hand.

14D0128. This site, at 70,000 square meters, is the largest site tested during the 1978-1979 project. Over 85 items were recovered per cubic meter within the 16 excavated units, indicating that the occupation was relatively intensive. Roughly 74% of the artifact assemblage consists of debitage and cores, including a high percentage of rough, blocky items unclassifiable as flakes. The remaining 26% of the excavated assemblage recovered during the 1978-1979 project consists of bifacial and unifacial items suitable for use in a wide range of cutting and scraping activities. A full-grooved ground stone axe fragment was recovered from the site during an earlier project (Johnson 1968). Although local gray and pink, possibly heat-treated cherts predominate in the assemblage, a wide variety of lithic materials occurs at the site.

The size of the site, the density of artifacts and the variety of raw materials all suggest that 14D0128 was either intensively occupied on a semi-permanent basis or repeatedly occupied for short periods over a long duration of time. The site is situated in a location that affords an excellent view of the valley floor, and this may have made the location attractive for a number of reasons. The site shares the same Upland Prairie parcel with 14D0127, 14D0129 and 14D0148, all of which are clustered relatively closely together. It is possible that all four sites may be functionally interrelated as a community, but temporal control is lacking to allow the verification of such an hypothesis.

14D0129. This is a moderately large site that covers an area of roughly 12,500 square meters. The artifact density in four test pits approached 73 items per cubic meter. This may indicate a relatively intensive occupation of this site, which is located only about 100 meters southeast of 14D0128.

Roughly 76% of the total assemblage at 14D0129 consists of unmodified debitage. The remaining portion includes a sizeable number of likely cutting and scraping tools. The absence of cores and primary decortication flakes from the sample of debitage suggests that secondary stages of tool manufacture and maintenance were relatively important at the site. This, together with the size and apparent intensity of the occupation of the site, is seen to support an hypothesis that 14D0129 represents a relatively permanent, repeatedly occupied settlement, possibly one related to those at 14D0127, 14D0128 and 14D0148.

14D0130. Due to the small number of items recovered during the testing little can be hypothesized concerning the occupation at this site. The site, at 5,625 square meters, is quite small and probably represents a limited activity area or a short-term campsite. This hypothesis is supported by the low density of material within the two test pits. The excavated assemblage is limited to debitage and two utilized flakes.

14D0131. This site occupies an area of roughly 20,000 square meters along an upland ridge. Although the site is large, the excavated test pits indicate that the site is characterized by only a moderate artifact density of approximately 45 items per cubic meter. A possible hearth was uncovered at the site, however, which suggests that the site was more than a limited special activity area. This hypothesis is somewhat supported by the relatively high percentage of the assemblage identified as probable cutting and scraping tools. Although 14D0131 may be a semi-permanent or often reoccupied spot, the limited artifact density suggests that the occupation was less intense, permanent, frequently repeated than at other large sites.

14D0132. This site occupies a small area of 5,000 square meters east of 14D0131. It is only about 200 meters from the larger site, and the two sites together may represent a functionally interrelated community. In addition to its small size, 14D0132 exhibits an extremely low density of cultural material. Since the total excavated prehistoric assemblage is limited to four items, little can be hypothesized concerning the specific activities undertaken at this small site.

14D0133. Although this site is relatively large, covering some 13,125 square meters, only 13 items were recovered from the testing operations. Within this meager total, a relatively high percentage consists of retouched and utilized flakes, but the small sample precludes making any substantive conclusions.

14D0134. This site covers a large area of 25,000 square meters and is located along an Upland Prairie ridge. Excavation revealed a relatively high density of artifacts. About 76 items were recovered per cubic meter. The site's size and artifact density suggest that it was a relatively large, repeatedly occupied settlement. Just under 70% of the artifact assemblage consists of unmodified debitage; cutting and scraping activities are indicated by the relatively high percentage of utilized and retouched flakes. Unlike either of the large or apparently intensively occupied sites to the west of the Clinton Reservoir, 14D0134 is situated in an area that offers no protection from the elements.

AD-A148 698

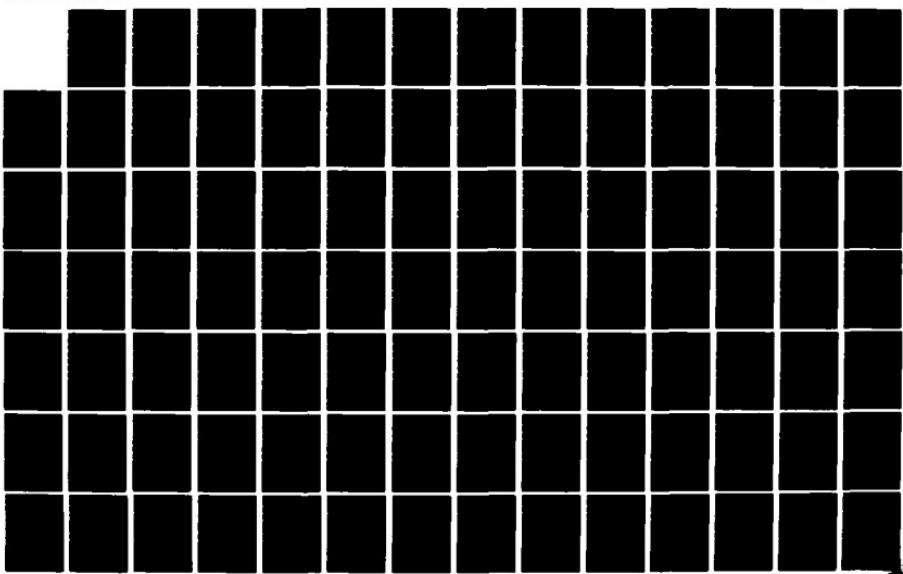
SURVEY AND TESTING OF ARCHEEOLOGICAL RESOURCES AT
CLINTON LAKE KANSAS 1978-1979(U) IROQUOIS RESEARCH INST
FAIRFAX VA M NATHAN AUG 88 DACW41-78-C-0854

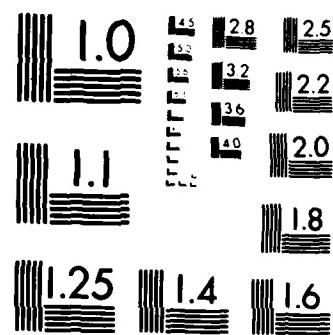
3/4

UNCLASSIFIED

F/G 5/6

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

14DO135. This site occupies 30,000 square meters of the same Upland Prairie ridge on which 14DO134 is located. About 59 items per cubic meter were recovered within the test pits. The size of the site and the moderately high density of cultural material may indicate that 14DO135 was the location of a relatively intensive, semi-permanent or frequently repeated occupation. Approximately 90% of the excavated material consists of unmodifieddebitage and cores; relatively few tools or finished artifacts were recovered from the excavations. If 14DO135 was a repeatedly occupied settlement, the relative lack of tools may suggest that a limited range of activities characterized the site.

14DO137. This site occupies 30,000 square meters along an Upland Prairie ridgeline. In addition to being large, 14DO137 exhibits a very high cultural debris density compared to other sites investigated in the Clinton Reservoir. Roughly 115 items were recovered per cubic meter from the seven test pits. These two factors strongly suggest that the site is a major settlement area. If this is the case, however, surprisingly few lithic artifacts are tools. Over 92% of the excavated sample of artifacts consists of unmodifieddebitage. Less than 8% of the sample appears to be tools, primarily utilized and retouched flakes. It is possible, however, that many of the apparently unmodified flakes would have been identified as tools if microscopic edge-wear studies had been performed.

A relatively wide variety of lithic raw material categories occurs at the site. This would be expected if 14DO137 were a major settlement area or if it had been often reoccupied by different prehistoric groups. The site is isolated and relatively distant from available water sources, however, and abundant field chert occurs on the site. This might suggest that a major reason for settlement in this location was the availability of chert.

14DO140. This site occupies 11,250 square meters. Excavation of four test pits suggests that the occupation was very intense, as a density of roughly 300 items per cubic meter characterized the site. The site contains large amounts of residual chert, and it may be suggested that it was heavily utilized as a source of raw materials. Cores are relatively abundant at the site, and debitage comprises 54% of the artifact sample. A relatively large number of utilized flakes and several retouched flakes were also recovered, suggesting that cutting and scraping activities were also common at the site. On these bases it may be suggested that 14DO140 was a relatively permanent or frequently revisited settlement at which the extraction of the locally available chert was a primary focus.

14DO144. This site occupies 15,000 square meters of the Wakarusa floodplain. An average of roughly 17 items was recovered per cubic meter. Over 90% of the excavated sample consists of unmodifieddebitage. Excavations at 14DO144 were quite deep in order to explore a possible buried occupation level. Since it was necessary to excavate through as much as 94 centimeters of sterile overburden before reaching the cultural deposit, however, the artifact density mentioned above is misleading. Based upon the recovery of ceramics from the surface, it may be suggested that, at least during the later occupations, 14DO144 was a relatively sedentary settlement. It is difficult to

determine what may have been the major foci of the occupations at the site, however, in view of the apparently limited amount of tools recovered, in comparison with other large sites.

14D0145. Although this site is large, occupying roughly 27,000 square meters, subsurface testing revealed a low artifact density of less than 27 items per cubic meter. In addition, over 90% of the sample consists of unmodified debitage, with less than 8% of the sample being utilized. The site occurs in an area offering a good overview of the valley floor. Based upon the limited amount of information recovered from the site, it is difficult to document a considerable range of activities or a particularly intensive occupation.

14D0148. This is a small site covering some 4,500 square meters of upland prairie overlooking the Wakarusa Valley. It is characterized by an extremely low artifact density of less than 19 items per cubic meter. Over 90% of the artifact assemblage consists of unmodified debitage. A hematite outcrop is located at the site, and it is possible that this served as an attraction for utilization of the site. The area also offers an excellent view of the valley. On the basis of the data at hand, however, this site can only be considered a small lithic scatter. No good evidence for either general occupation or a special purpose activity camp is present.

14D0154. This site is of moderately small size, occupying roughly 9,600 square meters. Excavations revealed a relatively high artifact density of approximately 74 items per cubic meter. An intact hearth was also uncovered during excavation. Over 15% of the artifact assemblage consists of utilized or modified flakes, suggesting that a variety of cutting and scraping activities were undertaken with regularity at the site. Debitage accounts for slightly less than 85% of the assemblage, and cores were also recovered, suggesting that all stages of artifact manufacture might have taken place at the site. Ceramics were recovered from the surface in 1976 (Iroquois Research Institute 1977), suggesting the presence of possible domestic or storage activities. On these bases, it may be hypothesized that 14D0154 was a relatively permanent or seasonally occupied settlement, involving a variety of activities.

14D0309. This site is of moderate size, occupying about 11,050 square meters along an Upland Prairie ridge. Excavations revealed a high density of cultural remains exceeding 140 items per cubic meter. Seventy-five percent of the assemblage consists of unmodified debitage. A relatively large number of utilized flakes were recovered, suggesting that a variety of cutting and scraping tasks were regularly undertaken at the site. The presence of cores and primary decortication flakes suggests that all stages of artifact manufacture are represented. The apparent intensity of the occupation and the relatively high percentage of cutting and scraping tools in the assemblage suggest that 14D0309 may represent a semi-permanent or repeatedly occupied settlement at which a variety of activities took place.

14D0310. This site is large and occupies 15,000 square meters along an Upland Prairie ridge. Excavations revealed a density of artifacts exceeding 73 items per cubic meter. Roughly 99% of the excavated lithic sample consists of

unmodified debitage and cores. This percentage, together with the occurrence of a chert outcrop immediately south of the site, suggests strongly that the major function of the occupation at 14DO310 was the collection and reduction of the locally available chert.

A site-by-site discussion of specific function is not feasible for the prehistoric sites located during the 1979 survey. It may be tentatively suggested, however, that 14DO155, 14DO157, 14SH101 and 14SH103 represent relatively sedentary occupations, based upon the occurrence of ceramics at these sites. Only 14SH101 is over 10,000 square meters in area, however, and with the exception of a projectile point fragment, the assemblage from 14DO157 completely lacks lithic tools. Therefore, these hypotheses are to be considered even more tentative than those concerning the tested sites.

If it is possible to assume that sites yielding ceramics are more likely to have been relatively long-term or sedentary occupations characterized by a relatively wide range of domestic activities, it may be significant that six of the seven sites investigated during the 1978-1979 project that have yielded ceramics are situated in lower elevations, in second terrace and floodplain locales. These six sites are 14DO3, 14DO144, 14DO154, 14DO155, 14SH101 and 14SH103. The seventh site, 14DO157, is located in the Wooded Slope zone. This may suggest the preferential location of relatively sedentary communities on or near the valley floor. It appears that minor tributaries, rather than the Wakarusa River itself, were preferred locations.

Large and apparently intense occupations are also not uncommon in higher elevations, however, particularly in a number of upland prairie locales. None of the large sites in the Upland Prairie zone yielded ceramics. It is possible that the absence of ceramics from the large upland sites reflects a more specialized function for these sites, but it may also be suggested that differential preservation or visibility conditions affected the recovery of ceramics in these situations.

Based upon data recovered in 1978-1979, it appears that small and relatively short-term occupations occurred in each of the ecological zones. These sites may represent special activity areas or collection stations centering upon the exploitation of a narrow range of resources available in each ecological zone.

Plate A indicates that the greatest overall density of prehistoric sites occurs in the valleys of the tributaries of the Wakarusa River, rather than in the Wakarusa River Valley itself. Deer Creek and Rock Creek valleys are particularly intensively occupied. These locations may have been preferred for several reasons. By virtue of being located in comparatively narrow valleys, these sites are situated near the abundant aquatic and terrestrial resources of the Floodplain Ecological Zone, yet also afford comparatively easy access to the resources of the higher ecological zones. In addition, the higher elevation of the tributary valleys in comparison with the Wakarusa valley makes these locales less vulnerable to damaging floods centered in the Wakarusa valley. Sites situated in or near the floodplains of the tributary valleys would have been comparatively sheltered from winter winds that affect the

broader Wakarusa floodplain or the bluff tops. It should also be noted, however, that the apparent absence of sites on the Wakarusa floodplain may also result from the burial of sites under alluvium.

The majority of the collected artifacts appear to be made of cherts which are common to the immediate region; there are relatively few chert types which may be presumed to be non-local varieties because of unusual colors or textures. At least one site, 14D0140, appears to have been a chert extraction station, and the numerous chert outcrops in the Clinton Lake area (O'Conner 1960) suggest that other sites were chert processing stations as well.

Selected environmental variables for prehistoric sites tested and inventoried during the 1978-1979 field program are summarized in Tables 59 and 60. These variables include soil type; range of slope; exposure, the direction in which a site slopes or is least protected by local physiography; and ecological zone.

As Table 60 shows, the 1979 survey inventoried four prehistoric sites on the Wakarusa floodplain, three sites on second terraces and one site each in the Upland Prairie and Wooded Slope zones. All but one of the sites located on the floodplain are exclusively on Reading silty clay loam while the sites in other ecological zones are on a variety of soils. With the exception of site 14D0157, all of the prehistoric sites have either open or southern exposures.

Table 61 presents occurrence rates for sites recorded during the 1979 field survey by ecological zone. The number of sites per ecological zone was divided by the square miles that each zone represented in the survey. The overall density of prehistoric sites in the study area, 0.9 sites per square mile, is relatively low. The highest occurrence rate for prehistoric sites is in the Floodplain Ecological Zone with 1.8 sites per square mile, followed by the Second Terrace Ecological Zone with 1.1 sites per square mile. Notably rare were sites located within the Upland Prairie and Wooded Slope zones.

On the other hand, the higher site occurrence rates in the Floodplain and Second Terrace Ecological Zones may be a result of survey bias since different intervals between transects were used in each of the four ecological zones. The low density of sites in the 1979 survey inventory in the Wooded Slope and Upland Prairie Ecological Zones may be partially attributable to the relatively low intensity of survey coverage in these areas. An unexpected result of the 1979 survey was the high site occurrence rate for the Floodplain Ecological Zone since previous reports have indicated a scarcity of sites in the Wakarusa floodplain (Chism 1966:37; Iroquois Research Institute 1977:173). All four prehistoric sites located in the floodplains during the 1979 survey are along the Wakarusa River in the extreme western end of the project in Shawnee County.

Because of the relatively simple nature of the sedimentary bedrock strata and sediments within the Clinton Lake project, there is a high degree of correlation between bedrock or sediment, topography, geomorphology, soils and natural biological communities. The single measure which best integrates the combined effects of these environmental factors is soil characteristics, which are an integrated result of past climates and natural ecosystems.

TABLE 59
DISTRIBUTION OF PREHISTORIC SITES TESTED IN 1978
ACCORDING TO ENVIRONMENTAL VARIABLES

SITE NUMBER	SIZE	SOIL TYPE	SLOPE RANGE	EXPOSURE DIRECTION	ECOLOGICAL ZONE
14D03	15,000	Vinland-Martin silty clay loam	7 to 15%	North	Second Terrace
14D0126	20,000	Martin-Oska silty clay loam	3 to 6%	Open	Upland Prairie
14D0127	7,500	Morrill clay loam	3 to 7%	Open	Upland Prairie
14D0128	70,000	Sharpsburg silt loam	1 to 4%	Open	Upland Prairie
14D0129	12,500	Woodson silt loam	0 to 1%	Open	Upland Prairie
14D0130	5,625	Sharpsburg silt loam	1 to 4%	Open	Upland Prairie
14D0131	20,000	Sharpsburg silt loam	1 to 4%	Open	Upland Prairie
		Morrill clay loam	3 to 7%	Open	Upland Prairie
14D0132	5,000	Sharpsburg silt loam	1 to 4%	Open	Upland Prairie
		Woodson silt loam	1 to 3%	Open	Upland Prairie
14D0133	13,125	Morrill clay loam	3 to 7%	Open	Upland Prairie
14D0134	25,000	Oska silty clay loam	3 to 6%	North	Upland Prairie

TABLE 59 (continued)

DISTRIBUTION OF PREHISTORIC SITES TESTED IN 1978
ACCORDING TO ENVIRONMENTAL VARIABLES

SITE NUMBER	SIZE	SOIL TYPE	SLOPE RANGE	EXPOSURE DIRECTION	ECOLOGICAL ZONE
14D0135	30,000	Woodson silt loam	1 to 3%	North-east	Upland Prairie
14D0137	30,000	Martin-Oska silty clay loam	3 to 6%	Open	Upland Prairie
14D0140	11,250	Stony steep land	Over 20%	South	Upland Prairie
14D0144	15,000	Kennebec silt loam	0 to 2%	East	Floodplain
		Reading silt loam	0 to 2%	South-east	Floodplain
14D0145	27,000	Martin-Oska silty clay loam	3 to 6%	Open	Upland Prairie
14D0148	4,500	Sharpsburg silt loam	1 to 4%	Open	Upland Prairie
14D0154	9,600	Gymer silt loam	3 to 8%	North	Second Terrace
		Vinland-Martin silty clay loam	7 to 15%	North	Second Terrace
14D0309	11,050	Oska silty clay loam	3 to 6%	Open	Upland Prairie
14D0310	15,000	Oska silty clay loam	3 to 6%	Open	Upland Prairie

TABLE 60

DISTRIBUTION OF PREHISTORIC SITES INVENTORIED DURING
THE 1979 SURVEY ACCORDING TO ENVIRONMENTAL VARIABLES

SITE NUMBER	SIZE	SOIL TYPE	SLOPE RANGE	EXPOSURE DIRECTION	ECOLOGICAL ZONE
14DO155	6,325	Oiska silty clay loam	0 to 6%	South-Southwest	Second Terrace
14DO156	1,900	Martin silty clay loam	3 to 7%	Southwest	Second Terrace
14DO157	1,050	Vinland-Martin complex	7 to 15%	East-Northeast	Wooded Slope
14DO158	3,500	Gymer silt loam	1 to 3%	Southeast	Upland Prairie
14SH101	23,200	Ladysmith silty clay loam	1 to 3%	Southeast	Second Terrace
		Kennebec silt loam	0 to 2%	Southeast	Second Terrace
		Broken alluvial land	3 to 45%	Southeast	Second Terrace
14SH102	300	Wabash silty clay loam	0 to 1%	Southwest	Floodplain
		Reading silty clay loam	0 to 2%	Southwest	Floodplain
14SH103	6,875	Reading silty clay loam	0 to 2%	Open	Floodplain
14SH104	3,875	Reading silty clay loam	0 to 2%	Open	Floodplain
14SH105	1,050	Reading silty clay loam	0 to 2%	Open	Floodplain

TABLE 61
SITE OCCURRENCE RATES FOR 1979 SURVEY

ECOLOGICAL ZONE	ACREAGE	SITES PER SQUARE MILE	
		PREHISTORIC SITES	HISTORIC ARCHAEOLOGICAL SITES
Floodplain	1,448	1.8 (n=4)	2.2 (n=5)
Second Terrace	1,702	1.1 (n=3)	3.0 (n=8)
Wooded Slope	2,427	0.3 (n=1)	1.0 (n=4)
Upland Prairie	1,014	0.6 (n=1)	1.3 (n=2)
TOTAL	6,591	0.9 (n=9)	1.8 (n=19)

The kinds of soils at each known prehistoric site in the project area were determined from the soil survey maps for Shawnee and Douglas Counties (USDA 1970, 1977), and a tabulation of prehistoric site occurrences for soil and land types is presented in Table 62. This table shows that over half of the prehistoric sites are on the Kennebec and Reading soil series. These two soil series are alluvial soils of the floodplains and low terraces of the Wakarusa River and its major tributaries, as is the Wabash series, which has only two site occurrences. These are the only three soil series in the Floodplain zone in the project area. Prehistoric sites were not located on only two of the soil series, Eudora and Pawnee, known to occur in the project area. These two series make up a very small portion of the project area.

In the eastern United States and the Plains, a higher density of prehistoric sites is normally expected in floodplains and low terraces than in uplands. In addition, surveys of the reservoir have furnished quantitative data showing a disproportionate distribution of sites among the three alluvial

TABLE 62

DISTRIBUTION OF KNOWN PREHISTORIC ARCHAEOLOGICAL SITES AT CLINTON LAKE ACCORDING TO SOIL AND LAND TYPES

SOIL AND LAND TYPES	NUMBER OF SITE OCCURRENCES	PERCENT OF SITE OCCURRENCES
Broken alluvial land	1	0.9
Gymer silt loam	2	1.8
Kennebec channeled	2	1.8
Kennebec silt loam	33	29.8
Labette silty clay loam	1	0.9
Ladysmith silty clay loam	1	0.9
Martin-Oska silty clay	3	2.7
Martin silty clay	2	1.8
Martin silty clay loam	8	7.2
Morrill clay loam	3	2.7
Oska silty clay loam	6	5.4
Reading silt loam	20	18.0
Reading silty clay loam	4	3.6
Sharpsburg silt loam	8	7.2
Sogn-Vinland complex	2	1.8
Stony steep land	5	4.5
Vinland complex	1	0.9
Vinland-Martin complex	3	2.7
Wabash silty clay loam	2	1.8
Woodson silt loam	4	3.6
TOTALS	111*	100%

* Number of occurrences is greater than number of sites because some sites were located on more than one soil type.

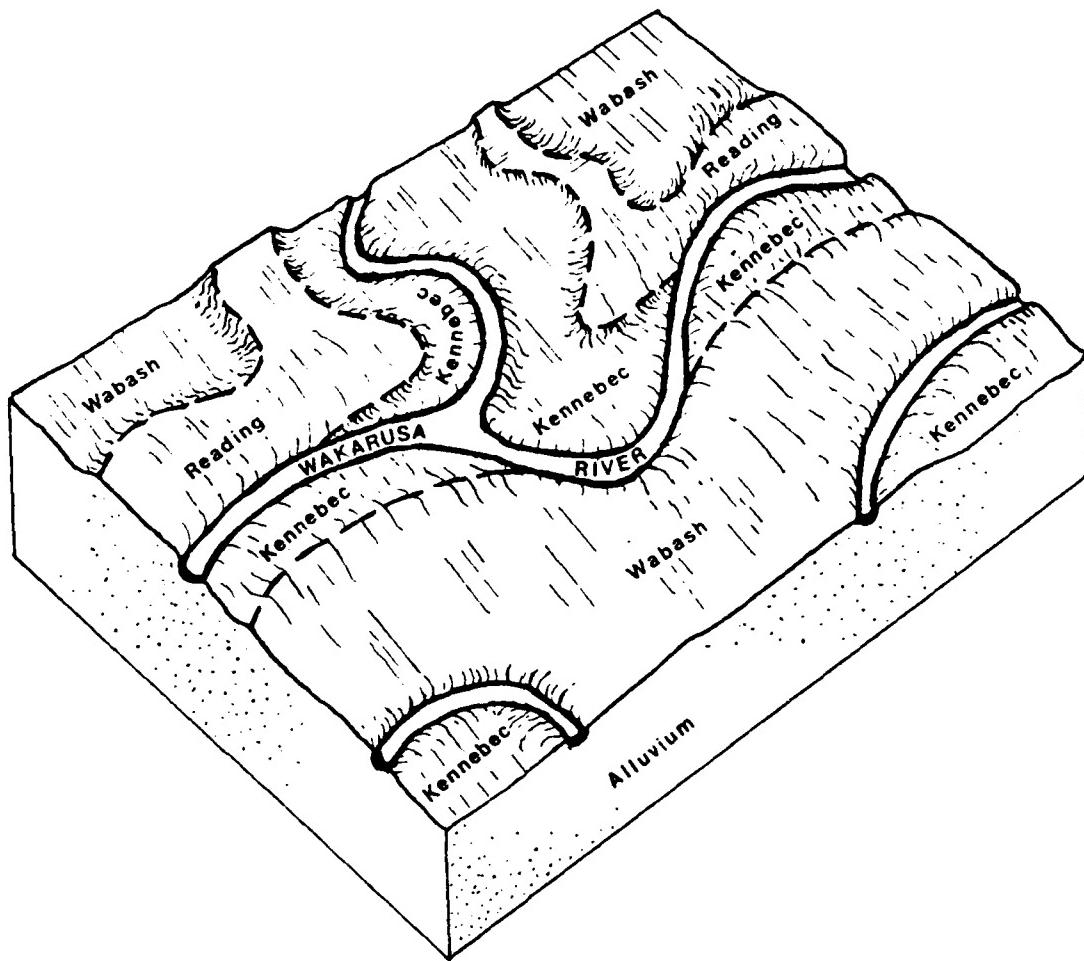
TABLE 63
PREFERENCE OF PREHISTORIC PEOPLES
FOR THE DIFFERENT ALLUVIAL SOILS SERIES
AT CLINTON LAKE, KANSAS

ALLUVIAL SOIL SERIES NAME	SOIL DRAINAGE CLASS	ACREAGE OF EACH SOIL SERIES	NUMBER OF SITE OCCURRENCES	SITE OCCUR- RENCE PER SQUARE MILE	PREFERENCE RATIO
Kennebec	Well Drained	3,124	36	7.38	27.5:1
Reading	Well Drained	4,600	24	3.34	12.5:1
Wabash	Poorly Drained	4,752	2	0.27	1:1
TOTALS		12,476	62	Well Drained:Poorly Drained = 18.5:1.	

soil series. The site occurrence rates for the different alluvial soil series, based on 1976 (Iroquois Research Institute 1977) and 1979 surveys, is shown in Table 63. The low rate of occurrence of sites on the Wabash soil series is understandable, as this soil is in poorly drained backswamp and does not occur adjacent to the stream channels as frequently as do the Kennebec and Reading series, as illustrated in Figure 3 (USDA 1970, 1977).

The preference ratios in Table 63 were obtained by taking the occurrence rate for the Wabash soil series as unity and then dividing the occurrence rates in sites per square mile for each soil series by the occurrence rate for the Wabash series. In making up this table, one site which occurs on Broken alluvial land in Shawnee County was included with the Kennebec series as this soil is contiguous with the Kennebec channeled soil type in Douglas County. The combined acreage of the Kennebec and Reading soils accounts for only 34.7% of the entire Clinton Lake project area, but 54.1% of all 111 site occurrences

FIGURE 3



Pattern of Alluvial Soils along the Wakarusa River and Its Tributaries
(Adapted from USDA 1977).

occur on these soils. In contrast, the Wabash soils encompass 21.4% of the project area yet only 1.8% of the prehistoric site occurrences are on Wabash soils. The predictive ability of the two well drained soils is further enhanced by the fact that the two sites which occur on Wabash soil also occur on Reading or Kennebec soils. Since there are no known prehistoric sites entirely on the Wabash soil, it may be concluded that had the entire 4,752 acres of Wabash soil been excluded from the archaeological surveys, the same inventory of prehistoric sites would have been compiled.

TABLE 64

DISTRIBUTION OF HISTORIC SITES INVENTORIED DURING
THE 1979 SURVEY ACCORDING TO ENVIRONMENTAL VARIABLES

SITE NUMBER	SOIL TYPE	SLOPE RANGE	EXPOSURE DIRECTION	ECOLOGICAL ZONE
14D0160	Martin soils complex	3 to 7%	Open	Second Terrace
	Wabash silty clay	0 to 2%	Open	Second Terrace
14D0161	Stony steep land	20 to 40%	South	Wooded Slope
	Kennebec soils- channeled	0 to 2%	South	Floodplain
14D0162	Oiska silty clay loam	3 to 6%	Northeast	Upland Prairie
14D0163	Kennebec soils- channeled	0 to 2%	Southwest	Second Terrace
14D0164	Reading silt loam	0 to 2%	South	Second Terrace
14D0165	Martin silty clay loam	3 to 7%	Southeast	Second Terrace
14D0166	Kennebec soils- channeled	0 to 3%	Southwest	Second Terrace
14D0167	Martin silty clay loam	3 to 7%	East	Wooded Slope
	Morrill clay loam	3 to 7%	East	Wooded Slope
14D0168	Martin silty clay loam	3 to 7%	Southeast	Wooded Slope

TABLE 64 (continued)

DISTRIBUTION OF HISTORIC SITES INVENTORIED DURING
THE 1979 SURVEY ACCORDING TO ENVIRONMENTAL VARIABLES

SITE NUMBER	SOIL TYPE	SLOPE RANGE	EXPOSURE DIRECTION	ECOLOGICAL ZONE
14DO169	Vinland-Martin Complex	7 to 15%	East	Wooded Slope
14DO171	Reading silt loam	0 to 2%	Open	Floodplain
14DO172	Kennebec silt loam	0 to 2%	Open	Floodplain
14DO173	Pawnee clay loam	3 to 7%	Southwest	Upland Prairie
14SH106	Martin silty clay loam	1 to 3%	Northwest	Second Terrace
14SH107	Martin silty clay loam	3 to 7%	Southeast	Second Terrace
14SH108	Martin silty clay loam	3 to 7%	Southwest	Wooded Slope
14SH109	Reading silty clay loam	0 to 2%	Open	Floodplain
14SH110	Reading silty clay loam	0 to 2%	Open	Floodplain
14SH111	Martin silty clay loam	3 to 7%	Southeast	Second Terrace
	Ladysmith silty clay loam	1 to 3%	Southeast	Second Terrace

TABLE 65
PRESENCE AND ABSENCE OF ARTIFACT DATA AT HISTORIC SITES

ARTIFACT SUB-CLASS*	SITES									
	I4D0160	I4D0161	I4D0162	I4D0163	I4D0164	I4D0165	I4D0166	I4D0167	I4D0168	I4D0169
1a	0	1	0	0	1	1	0	0	0	1
1b	0	0	0	0	0	0	0	0	0	0
1c	1	0	1	0	1	1	0	1	0	1
2a	0	0	0	0	0	0	0	0	0	0
2b	0	0	0	0	0	1	0	1	0	1
2c	0	0	0	0	1	1	0	1	0	1
2d	0	0	0	0	1	1	1	0	0	1
2e	0	0	0	0	0	0	0	0	0	0
2f	0	0	0	0	0	1	1	0	0	1
3a	0	0	0	0	0	0	0	0	0	0
3b	0	0	0	0	0	0	0	0	0	1
4a	0	0	0	0	0	0	0	0	0	0
4b	0	1	0	0	1	1	0	0	0	0
4c	0	0	0	0	1	0	0	0	0	0
5a	1	1	1	1	1	1	1	1	1	1
5b	0	1	0	0	1	0	0	0	0	1
6a	0	0	0	0	1	0	0	1	0	1
6b	0	0	0	0	1	1	0	0	0	1
6c	0	0	0	0	0	0	0	0	0	0
6d	0	0	0	0	0	0	1	0	0	1

*Artifact classes and subclasses are defined in Table 4.

1 = Present

0 = Absent

TABLE 65 (continued)

PRESENCE AND ABSENCE OF ARTIFACT DATA AT HISTORIC SITES

ARTIFACT SUB-CLASS*	SITES								
	14DO171	14DO172	14DO173	14SH106	14SH107	14SH108	14SH109	14SH110	14SH111
1a	0	1	0	0	1	0	1	0	0
1b	0	0	0	0	0	0	0	0	0
1c	1	1	1	1	1	1	1	1	1
2a	0	0	0	0	0	0	0	0	0
2b	0	0	0	0	0	0	0	0	0
2c	0	1	1	1	1	1	1	1	0
2d	1	0	0	0	1	0	0	1	0
2e	0	0	0	0	0	0	1	0	0
2f	1	0	0	0	0	1	0	0	0
3a	0	0	0	1	0	0	0	0	0
3b	0	0	0	0	1	0	0	0	0
4a	0	0	0	0	0	0	0	0	0
4b	0	0	0	0	0	0	0	1	0
4c	0	0	0	0	1	1	0	0	1
5a	1	1	1	1	1	1	1	1	1
5b	0	1	0	0	0	1	0	0	1
6a	0	0	0	0	1	0	0	0	0
6b	0	0	0	0	1	0	0	0	1
6c	0	0	0	0	0	0	0	0	0
6d	0	0	0	0	1	0	0	0	0

*Artifact classes and subclasses are defined in Table 4.

1 = Present

0 = Absent

Summary of Historic Resources

A total of 19 recent historic sites were recorded during the 1979 survey of the Clinton Lake project. All of these sites reflect the 20th century rural, agricultural character of the Wakarusa River Valley. The majority of them are the remains of farm buildings, primarily domestic structures and associated outbuildings. Evidence for recent occupation of these structures was found in the form of domestic utensils, crockery fragments and building materials. Most of the sites appear to have been recently abandoned due to the development of the Clinton Lake project.

Historic site occurrence rates according to ecological zone for sites recorded during the 1979 field survey are summarized in Table 61. The overall occurrence rate for historic sites located in the survey area is 1.8 sites per square mile, with 3.0 in the Second Terrace zone, 2.2 in the Floodplain zone, 1.3 in the Upland Prairie zone and 1.0 in the Wooded Slope zone. Thus, there is a greater occurrence of historic sites within the Second Terrace and Floodplain zones than within the Upland Prairie and Wooded Slope zones. The greater availability of soil suitable for agricultural use on the second terraces and floodplains would explain the preference for these zones by historic settlers. Other environmental variables relevant to the historic sites are presented in Table 64.

The artifact assemblages at the historic sites do not contain a wide variety of items, as can be seen in Table 65. Most of the construction materials used for the buildings are absent from the sites although cinder blocks, machined nails and window glass are occasionally present. This suggests that construction materials such as lumber and limestone were utilized at other locations outside of the project. Lumber may have been reutilized because most wood products have to be imported. Evidence that old planks and rubble limestone were reused is evident in several houses located near Clinton State Park which are constructed from a variety of materials.

RECOMMENDATIONS

Site Significance and National Register Eligibility

The following discussion of the significance of the Clinton Lake sites investigated by Iroquois Research Institute is based on the criteria for evaluation of cultural properties for inclusion in the National Register of Historic Places. The Advisory Council on Historic Preservation has established the following criteria of significance:

National Register criteria for evaluation. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) That are associated with the lives of persons significant in our past; or
- (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) That have yielded, or may be likely to yield, information important in prehistory or history (Code of Federal Regulations, Title 36, Chapter I, Part 60.6).

Given the generality of criterion "d," most CRM practitioners stress that the quality of significance in most prehistoric sites rests in the potential ability of the data present at a site to address explicitly defined research questions of local and national importance (see, e.g., Goodyear *et al.* 1978; Raab and Klinger 1979; Iroquois Research Institute 1977; but compare Sharrock and Grayson 1979). For eastern Kansas, much of the cultural chronology, especially with respect to the Plains Woodland (Reynolds, personal communication) and post-Atlantic Archaic (Johnson, personal communication), is still poorly understood. The nature of late prehistoric complexes like the Clinton phase and the Pomona focus and their relationships to the Plains Woodland Period and to the Central Plains tradition is also a topic of intensive study. Much also needs to be added to our knowledge of late Archaic developments in the eastern Plains, particularly in regard to local complexes such as Nebo Hill (Reid, personal communication; Blakeslee, personal communication). Additional evidence for the possible development of ceramics and plant management in late Plains Archaic complexes should be sought (Reid, personal communication). The discovery of in situ Paleo-Indian and early

Archaic occupations is always stressed (Johnson, personal communication). It is with respect to questions and research orientations such as these that the significance of the prehistoric resources of Clinton Lake should be assessed.

Based upon previous investigations (Iroquois Research Institute 1977), there is no reason to believe that the recent historic sites investigated qualify for eligibility under criteria "a" or "b," nor do they qualify under criterion "c," listed above. However, a number of the sites investigated during the testing and survey phases may be significant under criterion "d."

Four of the sites inventoried during the 1979 survey may require secondary testing to determine whether or not they meet the criteria for inclusion in the National Register of Historic Places. In comparison with the remainder of the sites discovered during the 1979 survey, sites 14D0155, 14SH101, 14SH103 and 14SH104 appear to have the potential to yield information which may be important in answering local and regional research questions. The remainder of the surveyed sites are not recommended for further action.

Site 14D0155 is on a second terrace in the Deer Creek Valley. A variety of artifacts were recovered from the site, including decortication and interior flakes, utilized flakes, scrapers, projectile points, and sherds. The diagnostic points suggest a Woodland occupation. The presence of pottery and the variety of stone tools suggest a semi-sedentary or fully sedentary occupational component for the site. Further study of the site is needed in order to clarify the nature of the occupation. The site should also be tested to determine if undisturbed strata exist and if features such as burials, storage pits or hearths are present.

Site 14SH101 is on the edge of a low second terrace above the Wakarusa River. Projectile points and point fragments, bifaces, a drill fragment, a hammerstone, core fragments, flake tools, scrapers, utilized flakes, sherds and a variety of debitage were recovered during surface collections and shovel testing. This artifact assemblage is one of the most varied in the project area, and an intensive occupational component appears to be present at the site. The diagnostic artifacts found indicate occupations during the Archaic, Plains Woodland and Plains Village Periods. Further study of 14SH101 is needed in order to clarify the nature and extent of occupations and to explore the potential for undisturbed cultural deposits. This site is also interesting because it is one of the few sites located adjacent to the Wakarusa River.

Site 14SH103 is located on the Wakarusa River floodplain in the western end of the project area, and near the 1857 "Indian Trail" (Iroquois Research Institute 1977:Plate 115). Artifacts recovered from the site include scrapers, utilized flakes, biface fragments, a core, debitage, sherds and an untyped projectile point. The site is important because it is one of the few prehistoric sites discovered on the floodplain of the Wakarusa River. Its location at the western end of the project area marks it as an important source of data for study of settlement systems and resource use in the project area. The site should be investigated to determine its period of occupation and to determine if intact subsurface features are present.

Site 14SH104 is also located on the Wakarusa floodplain at the western end of the project area. It resembles many of the upland sites in the project area in that it consists of a light lithic scatter. No diagnostic artifacts have been recovered from the site, and further work should be conducted to establish the period of occupation for this site. The site may provide important information needed to understand prehistoric resource utilization at different locations in the Wakarusa Valley. This site occurs near the "Indian Trail" indicated on the 1857 plat map of the Wakarusa Valley (Ibid.).

The recommended testing program at these four sites includes a combination of hand excavation of units, stripping portions of the plowzone with a road grader or small bulldozer, and trench excavation with a backhoe. Controlled surface collections have been made at these sites, and the available data is sufficient to identify areas within the sites with a high surface density of cultural materials. However, additional controlled, selective surface collections should be undertaken at the sites to recover diagnostic artifacts which may help to determine the periods of prehistoric occupation.

Four of the tested sites, 14D03, 14D0137, 14D0144 and 14D0154, contain cultural deposits of sufficient scientific importance to determine that they should be considered potentially eligible for inclusion in the National Register of Historic Places under criterion "d." The remainder of the tested sites are not felt to be significant enough to warrant inclusion in the National Register.

14D03

Site 14D03 is located on the edge of a cultivated second terrace adjacent to Deer Creek. The site was first reported in an early survey of the Clinton Lake impoundment area sponsored by the National Park Service (Chism 1966). It was subsequently tested under the supervision of Alfred Johnson of the University of Kansas (Johnson 1968).

The site dimensions are estimated to be approximately 100 x 150 meters. Materials present at the site include prehistoric lithics and ceramics. Lithic artifact categories in the site assemblage include bifaces, utilized flakes, retouched flakes, blades and debitage. Diagnostic artifacts in the collection indicate that the site was possibly occupied during the Plains Woodland through the Plains Village Periods. The site's integrity has been affected by plowing and erosion of the topsoil.

Johnson (Ibid.) assigned site 14D03 to the Clinton phase on the basis of test excavations at the site which were placed downslope from the principal area of artifact concentration. Based on the substantial size of the site and on the high density of cultural material recovered during the recent testing program, there appears to have been a fairly permanent settlement at this site. The site is important because it is likely to contain data which could more securely define the Clinton phase, assess its relationship to the preceding Plains Woodland phases, and clarify its relationship to the Pomona focus and Plains Village Period. Specific topics which could also be pursued by

additional investigation at this site include the study of community patterning within a Clinton phase hamlet and definition of the temporal range of the Clinton phase, which has not been securely established (Ibid.:135).

14D0137

Site 14D0137 is located in a cultivated field on a high ridgeline or cuesta which overlooks the confluence of the Wakarusa River and Deer Creek. The site was first discovered by Iroquois Research Institute during a survey of the upland areas of Clinton Lake (Iroquois Research Institute 1977).

The site dimensions are estimated to be 100 x 300 meters and the cultural material from the site is limited to prehistoric lithics. Major artifact categories identified in the collections are bifaces, utilized flakes, retouched flakes, a blade, a core and debitage. The only diagnostic artifact recovered from the site is a fragment of a Clovis point, which suggests the presence of a Paleo-Indian occupational component. Although the site has been plowed extensively and the topsoil has eroded, several of the test units excavated in the 1978 season revealed the presence of cultural materials below the plowzone.

The site appears to have been utilized primarily as a station for the initial preparation of outcropping chert for stone tool manufacture. The site is potentially significant because it has yielded evidence of Paleo-Indian occupation, and because it appears to contain undisturbed deposits that could place an early occupation in secure context. Information on the Paleo-Indian Period in eastern Kansas is rare. Although no evidence of Paleo-Indian activity beyond the single Clovis point base has been recovered, it is possible that additional Paleo-Indian materials are present at the site.

14D0144

Site 14D0144 is located in a formerly cultivated field in the floodplain of the Wakarusa River. It was first discovered by Iroquois Research Institute in 1976 during a survey of the previously unsurveyed portions of the Clinton Lake project area (Iroquois Research Institute 1977).

The site dimensions are estimated to be approximately 100 x 150 meters. Cultural material present at the site includes prehistoric lithics and ceramics, and organic remains have also been fairly well preserved. Major lithic artifact categories in the collection are bifaces, utilized flakes, retouched flakes, blades, debitage and fire cracked rock. Based on the identification of diagnostic artifacts in the assemblage, occupation of the site during the Archaic, Plains Woodland and Plains Village Periods is indicated. Although the upper portion of the site has been disturbed by cultivation and erosion, an apparently intact subsurface horizon was uncovered during deep testing of the site. The lower horizon of the site contains a probable Archaic occupational component and is separated from the upper horizon by a layer of sterile soil.

Site 14DO144 may have one of the longest records of prehistoric occupation in the project area, from the Archaic Period to the Plains Village Period. The deeply stratified deposits at the site offer the opportunity to develop a secure stratigraphic sequence of prehistoric cultural developments in the Clinton Reservoir area which span thousands of years.

14DO154

Site 14DO154 is located in a cultivated field on a second terrace adjacent to Deer Creek. The site is approximately 50 meters from site 14DO3 on an adjacent terrace lobe. The site was inventoried during the 1976 survey of the upland areas of the Clinton Lake project (Iroquois Research Institute 1977), but at that time it was thought to be the previously recorded site 14DO3. Intensive, controlled surface collection and preliminary testing were done at the site during the 1976 field season.

The site dimensions are estimated to be approximately 80 x 120 meters, and the cultural materials recovered at the site include prehistoric lithics and ceramics. Organic remains in the form of charcoal and carbonized wood have also been fairly well preserved. Major lithic artifact categories in the collection are bifaces, utilized flakes, retouched flakes, a blade, cores, debitage and a ground stone tool. Diagnostic artifacts in the collection indicate a possible Archaic Period occupation and Plains Woodland and Plains Village Period components at the site. Although the site integrity has been affected by plowing and erosion, cultural materials were recovered in sub-plowzone contexts in three of the five test pits excavated at this site. A feature identified as a prehistoric hearth was present in one of the excavation units.

The variety of artifact types in the assemblage, the density of cultural debris, and the size of the site suggest that a semi-permanent or permanent occupation occurred at the site. The recovery of artifacts from sub-plowzone contexts in three of the test pits placed at the site and the presence of a hearth in one of the pits indicate the likelihood that other intact subsurface features such as storage pits, post molds, house floors and burials exist at the site. The site therefore has the potential to contribute to study of community patterning within one of the most intensively utilized sectors of the Wakarusa River Valley.

Assessment of Project Impacts

The types of impacts expected to occur at the Clinton Lake project include total destruction caused by construction of the various project facilities, permanent inundation beneath the lake, severe erosion at the lake shoreline, disturbance by agricultural activities, and vandalism and looting of sites by members of the public using the project. A summary of direct project impacts on all recorded prehistoric sites in the project area is presented in Table 66.

TABLE 66
MANAGEMENT SUMMARY OF KNOWN PREHISTORIC SITES IN THE CLINTON PROJECT AREA

<u>Site</u>	<u>Project Related Impact</u>	<u>Recommendation</u>
14D02	Inundation	No further work
14D03	Wave scour; occasional inundation	National Register
14D04	Inundation	No further work
14D05	Wave scour; inundation	No further work
14D06	Has been used as borrow pit	No further work
14D07	Has been used as borrow pit	No further work
14D08	Has been used as borrow pit	No further work
14D09	Inundation	No further work
14D015	Minimal impact; occasional inundation	No further work
14D016	Minimal impact; occasional inundation	No further work
14D018	Inundation	No further work
14D019	Minimal impact; occasional inundation	No further work
14D020	Inundation	No further work
14D021	Inundation	No further work
14D027	Inundation	No further work
14D028	Inundation	No further work
14D029	Inundation	No further work
14D032	Minimal impact; occasional inundation	No further work
14D033	Inundation	No further work
14D034	Inundation	No further work
14D035	Minimal impact; occasional inundation	No further work
14D036	Minimal impact; occasional inundation	No further work
14D037	Minimal impact	No further work
14D039	Minimal impact; occasional inundation	No further work
14D040	Minimal impact; occasional inundation	No further work
14D041	Minimal impact; occasional inundation	No further work
14D042	Minimal impact; occasional inundation	No further work
14D043	Inundation	No further work
14D044	Inundation	No further work
14D045	Occasional inundation; low intensity public use	No further work
14D046	Inundation	No further work
14D047	Inundation	No further work
14D048	Inundation	No further work
14D049	Inundation	No further work
14D050	Inundation	No further work

TABLE 6b (continued)
MANAGEMENT SUMMARY OF KNOWN PREHISTORIC SITES IN THE CLINTON PROJECT AREA

Site	Project Related Impact	Recommendation
14D051	Has been used as borrow pit	No further work
14D052	Has been used as borrow pit	No further work
14D053	Has been used as borrow pit	No further work
14D054	Has been used as borrow pit	No further work
14D055	Inundation	No further work
14D056	Inundation	No further work
14D057	Inundation	No further work
14D058	Wave scour; occasional inundation	No further work
14D059	Minimal impact; occasional inundation	No further work
14D060	Inundation	No further work
14D061	Minimal impact; occasional inundation	No further work
14D062	Minimal impact; occasional inundation	No further work
14D065	Minimal impact	No further work
14D067	Inundation	No further work
14D068	Minimal impact; occasional inundation	No further work
14D069	Inundation	No further work
14D070	Occasional inundation; low intensity public use	No further work
14D071	Inundation	No further work
14D072	Inundation	No further work
14D073	Minimal impact; occasional inundation	No further work
14D074	Inundation	No further work
14D0126	Access road (may be rerouted); high intensity public use	No further work
14D0127	Heavy pedestrian traffic near play field	No further work
14D0128	Athletic field development	No further work
14D0129	Construction of heavy buildings, utilities and dining hall	No further work
14D0130	Volley ball court and utility line construction	No further work
14D0131	Stabilization pond excavation	No further work
14D0132	Travel trailer park and associated utility construction	No further work
14D0133	Occasional inundation; low intensity public use	No further work
14D0134	Hiking trail	No further work
14D0135	Low intensity public use	No further work
14D0136	Low intensity public use	No further work
14D0137	Low intensity public use	National Register
14D0138	Wave scour; occasional inundation	No further work

TABLE 66 (continued)

MANAGEMENT SUMMARY OF KNOWN PREHISTORIC SITES IN THE CLINTON PROJECT AREA

<u>Site</u>	<u>Project Related Impact</u>	<u>Recommendation</u>
14D0139	Occasional inundation; low intensity public use	No further work
14D0140	Wave scour during high flood stage	No further work
14D0141	Minimal impact; occasional inundation	No further work
14D0142	Wave scour and inundation during flood stage	No further work
14D0143	Minimal impact; occasional inundation	No further work
14D0144	Inundation	National Register
14D0145	Entrance road construction	No further work
14D0146	Occasional inundation; low intensity public use	No further work
14D0147	Minimal impact; occasional inundation	No further work
14D0148	Ground camping facility; heavy pedestrian traffic	No further work
14D0149	Low intensity public use	No further work
14D0150	Low intensity public use	No further work
14D0151	Inundation	No further work
14D0152	Inundation	No further work
14D0153	Minimal impact; occasional inundation	No further work
14D0154	Wave scour; occasional inundation	National Register
14D0155	Wave scour; occasional inundation; low intensity public use	Secondary testing
14D0156	Wave scour; occasional inundation; low intensity public use	No further work
14D0157	Occasional inundation; low intensity public use	No further work
14D0158	Recreational use; high intensity public use	No further work
14D0309	Construction for waterline; trailer camping; play area; heavy pedestrian traffic	No further work
14D0310	Access road construction (may be rerouted)	No further work
14SH5	Minimal impact; wave scour at high flood stage	No further work
14SH6	Minimal impact; wave scour at high flood stage	No further work
14SH101	Wave scour; occasional inundation; low intensity public use	Secondary testing
14SH102	Wave scour; occasional inundation; low intensity public use	No further work
14SH103	Wave scour; occasional inundation; low intensity public use	Secondary testing
14SH104	Wave scour, occasional inundation; low intensity public use	Secondary testing
14SH105	Wave scour; occasional inundation; low intensity public use	No further work

The most severe adverse effects will be those caused by erosion at the lake shoreline. Shoreline erosion will be most intensive at the edge of the permanent conservation pool 875.5 feet above mean sea level because of the wave action. Within a few years, archaeological sites along the shoreline will be deflated by sheet erosion and gullying.

The planned construction of various engineering and public use facilities will also cause harmful effects to archaeological sites in the project area. The displacement of soil containing archaeological material will cause a loss of contextual data which will significantly decrease the sites' potential to yield information on the prehistory of the area.

The continued use of certain portions of the project area for agriculture will cause adverse effects to some archaeological sites. Plowing will cause vertical and lateral mixing of soil strata containing archaeological materials, resulting in a loss of contextual association. Sites located in plowed fields will be more subject to erosion as a result of cultivation.

The development of Clinton Lake as a public use facility will have the effect of increasing the potential for souvenir collecting by the general public.

Of the four sites considered potentially eligible for inclusion in the National Register, one site, 14DO144, will be inundated beneath the permanent conservation pool. Site 14DO144 will normally be covered by approximately 15 feet of water; it may be subject to shoreline erosion during periods when the lake is below normal elevation, and it may be subject to impacts related to sedimentation and organic decomposition at other times.

Sites 14DO3 and 14DO154 are adjacent to one another in a portion of the project designated for wildlife management. These sites have been disturbed by repeated plowing and erosion and will continue to suffer from erosion if cultivation continues. Both sites are located at elevations between 268 meters (880 feet) and 274 meters (900 feet) above mean sea level, and they will therefore be subject to occasional inundation and shoreline scour during periods of flooding.

Site 14DO137 is located in the Woodridge Recreation Area at an elevation between 311 meters (1,020 feet) and 314 meters (1,030 feet) above mean sea level. A series of hiking trails will pass through this area, although none will directly intersect the site. The site may be subjected to occasional vandalism or pothunting.

All four of the sites for which secondary archaeological testing may be necessary to determine their eligibility for inclusion in the National Register are located above the permanent pool elevation in areas that are presently under agricultural use. These sites will be subject to occasional inundation and shoreline scouring during periods of flooding. Continued agricultural activity in these areas will disturb the contextual association of the cultural materials and will accelerate the effects of erosion.

Mitigation of Adverse Effects

In the developing science of cultural resource management, three general strategies of impact mitigation have been developed for compliance with federal laws: (1) avoidance of adverse impacts through modification of project design, (2) in situ resource preservation, and (3) data recovery or salvage. Of these, the first alternative is the generally favored course of action for two reasons. First, modification of the project design may often completely remove a resource from project related impacts. Second, project design modification is often more practical and less costly than in situ resource preservation or data recovery.

The second mitigation strategy, in situ preservation, is preferred when two conditions exist: first, when the required project design modifications are of such a magnitude that from a project planner's point of view they are impractical; and second, when viable engineering solutions are available to effectively protect and preserve a particular resource from the impending project impacts.

The third mitigation strategy, data recovery, is usually the least preferred alternative because (1) it is seldom possible to effect a fully adequate and complete data recovery program, (2) it often requires very large expenditures of money, and (3) it may delay completion of a project for months or years. For the present project, mitigation by avoidance of impacts and in situ preservation are given primary consideration.

Major project design modifications are not recommended as a realistic mitigation strategy at Clinton Lake, since construction of the dam has already been completed and construction of public use facilities has been initiated. In some cases, minor design alterations may be practical, such as limiting parking facilities near archaeologically sensitive areas, or redesigning public use facilities. However, the most widespread adverse effects related to the Clinton Lake project are attributable to inundation.

Various methods of in situ preservation have been proposed in recent years (Lenihan *et al.* 1977), but no method for preservation has been granted recognition as an adequate mitigation strategy to offset the effects of inundation. Currently, a project initiated by the National Park Service (*Ibid.*) is studying the effects of fresh-water inundation on archaeological sites. One of the sites at Clinton Lake, 14D0144, has been prepared for a comparable inundation study. This is discussed further in Appendix C.

Sites 14D03 and 14D0154 are adjacent to one another in a portion of the project designated as a wildlife management area. Both sites are in fields which are leased for agriculture. They are above the shoreline of the permanent pool; however, they will be subject to hydrological impacts during periods of intense flooding. The recommended actions to preserve these sites and to minimize future impacts to them include: (1) removal of the crop leases on these tracts, (2) planting of the area in bromegrass or prairie cordgrass to ameliorate further erosion, and (3) periodic visitation of the sites by the park ranger to ensure that the sites are not being vandalized.

Site 14DO137 is in the Woodridge Recreation Area and will be subjected to low intensity public use. The site will not be impacted by construction or inundation, but it may be subject to occasional vandalism. The recommended action to preserve the site and prevent adverse impacts is to patrol the site area on a periodic basis to ensure that it is not vandalized.

Site 14DO144 will be inundated beneath the normal conservation pool of Clinton Lake and, as of May 1979, it had been impacted by fluctuating inundation to a maximum depth of two feet. The site will quickly be covered as the lake level continues to rise. At the normal pool level, the site will be under approximately 15 feet of water and during dry periods the site will be subject to shoreline erosion. Although the precise effects of inundation cannot be forecasted, some loss of data is likely to result from sedimentation, erosion and decomposition of organic material. The buried horizon may possibly be preserved relatively intact, but the fact that the site will be submerged results in a total data loss for the entire site.

Since no realistic alternatives for avoidance of impacts or for site preservation seem to exist, a program of data recovery must be considered for 14DO144. In order to effectively conduct a data recovery program, it would be necessary to temporarily suspend the filling of the lake. If this were done, an archaeological data recovery program could be oriented towards: (1) location and excavation of intact features such as house patterns, hearths, storage pits, refuse pits and midden areas, (2) recovery of radiocarbon and other datable samples so the periods of occupation may be precisely determined, and (3) recovery of botanical remains which may provide information on prehistoric subsistence patterns and on the composition of the local environment during the periods of occupation. The data recovery program should combine hand excavation with machine stripping of the plowzone and the sterile soil which separates the two occupational horizons. Following the data recovery, the recovered materials should be analyzed and a scientific report summarizing the results should be prepared.

Recognizing that it may not be realistic to suspend the filling of Clinton Lake, alternate mitigative options may be considered. In coordination with the National Park Service, Southwest Cultural Resources Center (Rayl, personal communication), two site datums have been placed at the site, and soil samples have been collected and analyzed from various levels. This preparation is intended to allow the study of chemical and biological changes in the site resulting from inundation, and the permanent datums should facilitate the relocation of site 14DO144 when the lake level recedes. This preparation is discussed in detail in Appendix C.

Interpretive Potential

The knowledge gained from the cultural resource investigations at Clinton Lake could be incorporated into part of an interpretive program for the public. Suggestions for incorporating prehistoric themes into the overall interpretive

program include preparation of a display of artifacts diagnostic of the cultural periods represented in the reservoir area in a museum case to be housed in the visitor's center. Also, interpretive plaques could be placed along hiking trails. It is not recommended that any specific sites be chosen for display, but interpretive markers outlining the aboriginal way of life could be placed at various scenic overlooks.

Summary Recommendations

Secondary testing should be undertaken at four sites inventoried in the 1979 survey to determine if these sites meet the criteria of eligibility for inclusion in the National Register. Four of the sites tested under the current contract are recommended for inclusion in the National Register. Iroquois Research Institute has prepared the necessary nomination forms for these sites. It is recommended that the Corps of Engineers, upon receipt of the nomination forms, consult with the Kansas State Historic Preservation Officer regarding the significance of these sites and that a formal determination of eligibility be sought from the Secretary of the Interior. If any of the sites are declared to be eligible for the National Register, the Corps of Engineers should consider the recommendations for mitigation of adverse effects and the appropriate implementation of them.

REFERENCES CITED

Agogino, G.A. and W.D. Frankforter

- 1970 A Paleo-Indian Bison Kill in Northwestern Iowa. American Antiquity 25:414-415.

Ahler, Stanley A.

- 1971 Projectile Point Form and Function at Rodgers Shelter, Missouri. Missouri Archaeological Society Research Series No. 8. Columbia.

Banks, Larry

- 1974 A Comparative Analysis of Lithics at the Martin-Vincent Site. Paper presented at the 1974 Caddo Conference. 6-8 May 1974. Arkadelphia, Arkansas.

Barr, Thomas P.

- 1966 The Pruitt Site: A Late Plains-Woodland Manifestation in Murray County, Oklahoma. Oklahoma River Basin Survey Archaeological Site Report No. 5. Norman.

Bastian, Tyler

- 1969 The Hudsonpillar and Freeman Sites, North-Central Oklahoma. Oklahoma River Basin Survey Archaeological Site Report No. 14. Norman.

Bell, Robert E.

- 1958 Guide to the Identification of Certain American Indian Projectile Points. Oklahoma Anthropological Society Special Bulletin No. 1. Oklahoma City.

- 1960 Guide to the Identification of Certain American Indian Projectile Points. Oklahoma Anthropological Society Special Bulletin No. 2. Oklahoma City.

Bell, Robert E. and David A. Baerreis

- 1951 A Survey of Oklahoma Archaeology. Bulletin of the Texas Archaeological and Paleontological Society 22:7-100.

Bell, Robert E., Edward B. Jelks and W.W. Newcomb, eds.

- 1967 A Pilot Study of Wichita Indian Archaeology and Ethnohistory. Report to the National Science Foundation for Grant GS-964. Dallas.

Brown, Kenneth L.

- 1977 Historic and Prehistoric Cultural Resources of the Blue Springs and Longview Lakes, Jackson County, Missouri. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.

Byrd, K.M. and R.W. Neuman

- 1978 Archaeological Data Relative to Prehistoric Subsistence in the Lower Mississippi River Alluvial Valley. Geoscience and Man XIX. Baton Rouge, Louisiana.

Caldwell, Warren W. and Dale R. Henning

- 1978 North American Plains. In Chronologies in New World Archaeology. Edited by R E. Taylor and Clement W. Meighan. Academic Press. New York. Pp. 113-145.

Carlson, Gayle F. and Curtise A. Peacock

- 1977a Nehawka Flint (Chert). In Lithic Source Notebook. Assembled by Ronald A. Thomas. Island Field Archaeological Museum. Mildford, Delaware.

- 1977b Flint Hills Flint. In Lithic Source Notebook. Assembled by Ronald A. Thomas. Island Field Archaeological Museum. Mildford, Delaware.

Chapman, Carl H.

- 1975 The Archaeology of Missouri, I. The University of Missouri Press. Columbia.

Chism, James V.

- 1966 Appraisal of the Archeological Resources of the Clinton Reservoir, Douglas, Osage, and Shawnee Counties, Kansas, 1965. University of Kansas Museum of Natural History. Lawrence.

Fenneman, M.N.

- 1939 Physiography of the United States. McGraw-Hill, Inc. New York.

Goodyear, Albert C., L. Mark Raab and Timothy C. Klinger

- 1978 The Status of Archaeological Research Design in Cultural Resource Management. American Antiquity 43:159-173.

Gradwohl, David M.

- 1969 Prehistoric Villages in Eastern Nebraska. Nebraska State Historical Society Publications in Anthropology No. 4. Lincoln.

Grosser, Roger

- 1973 A Tentative Cultural Sequence for the Snyder Site, Kansas.
Plains Anthropologist 18:228-238.

Gruger, Johanna

- 1973 Studies on the Late Quaternary Vegetation History of Northeastern Kansas. Bulletin of the Geological Society of America 84:239-250.

Hartley, John D.

- 1974 The Von Elm Site: An Early Plains-Woodland Complex in North-Central Oklahoma. Oklahoma River Basin Survey Archaeological Site Report No. 28. Norman.

Hartley, John D. and A.F. Miller

- 1977 Archaeological Investigations at the Bryson-Paddock Site: An Early Contact Period Site on the Southern Plains. Oklahoma River Basin Survey Archaeological Site Report No 32. Norman.

Henning, Dale R.

- 1978 Commentary. In The Central Plains Tradition: Internal Development and External Relationships. Edited by Donald J. Blakeslee. Office of the State Archaeologist, University of Iowa Report No. 11. Iowa City. Pp. 163-166.

Henry, Donald O., Barbara Butler and Stephen A. Hall

- 1979 The Late Prehistoric Human Ecology of Birch Creek Valley, Northeastern Oklahoma. Plains Anthropologist 24:207-237.

Hofman, Jack L.

- 1978 The Development and Northern Relationships of Two Archaeological Phases in the Southern Plains Subarea. In The Central Plains Tradition: Internal Development and External Relationships. Edited by Donald J. Blakeslee. Office of the State Archaeologist, University of Iowa Report No. 11. Iowa City. Pp. 6-35.

Hughes, Jack T.

- 1972 Projectile Point Types of Texas and Bordering States. Chart published by the West Texas State University Anthropological Society. Canyon, Texas.

Iroquois Research Institute

- 1977 The Cultural Resources of Clinton Lake, Kansas: An Inventory of Archaeology, History and Architecture. Report submitted to the U.S. Army Corps of Engineers, Kansas City District, under Contract No. DACW41-76-C-0136.

Jennings, Jesse D.

1974 Prehistory of North America. McGraw-Hill. New York.

Johnson, Alfred E.

1968 Archaeological Investigations in the Clinton Reservoir Area, Eastern Kansas. Museum of Anthropology, University of Kansas. Lawrence.

1974 Settlement Pattern Variability in Brush Creek Valley, Platte County, Missouri. Plains Anthropologist 19:107-122.

1976 Hopewellian Archaeology in the Lower Missouri Valley. University of Kansas Publications in Anthropology No. 8. Lawrence.

Johnson, Alfred E., Dennis D. Yapple and L.E. Bradley

1972 Systematic Change and Lithic Debris: The Nine Mile Creek Survey. Plains Anthropologist 17:501-511.

Joyer, Janet E. and Donna C. Roper

In Press Archaic Adaptations in the Central Osage River Basin: A Preliminary Assessment.

King, Francis B.

1977 Spatial and Temporal Distribution of Plant Resources in the Harry S. Truman Reservoir. In Cultural Resources Survey Harry S. Truman Dam and Reservoir Project, Volume X: Environmental Study Papers. By R.A. Ward, T.L. Thompson, C.V. Haynes, F.B. King and D.L. Johnson. Pp. 33-58. Report submitted to the U.S. Army Corps of Engineers, Kansas City District, by the University of Missouri, Columbia under Contract No. DACW41-75-C-0202.

King, James E.

1975 A Survey of the Pleistocene Spring Bogs of the Lower Pomme de Terre River Valley, Benton and Hickory Counties, Missouri. Report submitted to the U.S. Army Corps of Engineers, Kansas City District, by the Quaternary Studies Center, Illinois State Museum.

Kivett, Marvin F.

1949 Archaeological Investigations in Medicine Creek Reservoir, Nebraska. American Antiquity 14:278-284.

1953 The Woodruff Ossuary: A Prehistoric Burial Site in Phillips County, Kansas. River Basin Survey Papers No. 3. Bureau of American Ethnology Bulletin No. 154. Smithsonian Institution. Washington, D.C.

Koch, Alfred K.

- 1857 Mastodon Remains in the State of Missouri, Together with Evidence of the Existence of Man Contemporaneously with the Mastodon. Transactions of the Academy of Science of St. Louis 1:61-64.

Krueger, Harold W.

- 1980 Letter report of radiocarbon determinations to Iroquois Research Institute dated 10 January 1980. On file at Iroquois Research Institute, Fairfax, Virginia.

Lehmer, D.J.

- 1952 The Fort Pierre Branch, Central South Dakota. American Antiquity 17:329-336.

- 1954 The Sedentary Horizon of the Northern Plains. Southwestern Journal of Anthropology 10:139-159.

- 1971 Introduction to Middle Missouri Archaeology. National Park Service Anthropological Papers No. 1. Washington, D.C.

Lenihan, Daniel J., Toni L. Carrell, Thomas S. Hopkins, A. Wayne Prokopetz, Sandra L. Rayl and Cathryn S. Tarasovic

- 1977 The Preliminary Report of the National Reservoir Inundation Study. U.S. Department of the Interior, National Park Service, Southwest Cultural Resources Center. Santa Fe, New Mexico.

Leonhardy, F.C.

- 1966 Domebo: A Paleo-Indian Mammoth Kill in the Prairie-Plains. Contributions of the Museum of the Great Plains No. 1. Lawton, Oklahoma.

Lewis, Kenneth E.

- 1977 Sampling the Archaeological Frontier: Regional Models and Component Analysis. In Research Strategies in Historical Archaeology. Edited by Stanley South. Academic Press. New York. Pp. 151-201.

McKern, W.C.

- 1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. American Antiquity 16(1):301-313.

Marshall, James O.

- 1972 The Archaeology of the Elk City Reservoir: A Local Archaeological Sequence in Southeast Kansas. Kansas State Historical Society Anthropological Series No. 6. Topeka.

Martin, Larry D. and B. Miles Gilbert

- 1978 Excavations at Natural Trap Cave. Transactions of the Nebraska Academy of Science 4:107-116.

Martin, Larry D. and A.M. Neuner

- 1978 The End of the Pleistocene in North America. Transactions of the Nebraska Academy of Science 4:117-126.

Morse, Dan F. and Phyllis A. Morse, eds.

- 1977 Excavation, Data Interpretation, and Report on the Zebree Homestead Site, Mississippi County, Arkansas. Report submitted to the U.S. Army Corps of Engineers, Memphis District, by the Arkansas Archeological Survey under Contract No. DACW66-76-C-0006.

Munsell Color

- 1975 Munsell Soil Color Chart. Kollmorgen Corporation. Baltimore, Maryland.

Newell, N.D.

- 1931 Mineral Resources of Wyandotte County. State Geological Survey of Kansas Circular No. 4. Lawrence.

Nickel, Christine

- 1973 Two Archaeological Sites in the Perry Reservoir Region, Jefferson County, Kansas. Unpublished M.A. thesis. Wichita State University. Wichita, Kansas.

North Central Region Soil Testing Committee

- 1975 Recommended Chemical Soil Test Procedures for the North Central Region. North Dakota Agricultural Experiment Station, North Dakota State University. Fargo.

O'Brien, Patricia J.

- 1972 Urbanism, Cahokia, and the Middle Mississippian. Archaeology 25:189-197.

- 1978 Steed-Kisker and Mississippian Influences on the Central Plains. In The Central Plains Tradition: Internal Development and External Relationships. Edited by Donald J. Blakeslee. Office of the State Archaeologist, University of Iowa Report No. 11. Iowa City. Pp. 67-80.

O'Conner, Howard G.

- 1960 Geology and Ground-Water Resources of Douglas County, Kansas. State Geological Survey of Kansas Bulletin 148. Topeka.

Parker, Martha and Betty Laird

- 1976 Soil of Our Souls. Coronado Press. Lawrence, Kansas.

Perino, Gregory

- 1968 Guide to the Identification of Certain American Indian Projectile Points. Oklahoma Anthropological Society Special Bulletin No. 3. Oklahoma City.

Raab, L. Mark and Timothy C. Klinger

- 1979 A Reply to Sharrock and Grayson on Archaeological Significance. American Antiquity 44:328-330.

Reeves, Brian

- 1973 The Concept of an Altithermal Cultural Hiatus in Northern Plains Prehistory. American Anthropologist 75:1221-1253.

Reid, Kenneth C.

- 1976 Prehistoric Trade in the Lower Missouri River Valley: An Analysis of Middle Woodland Bladelets. In Hopewellian Archaeology in the Lower Missouri Valley. Edited by Alfred E. Johnson. University of Kansas Publications in Anthropology 8:63-99.

- 1980 Nebo Hill, Archaic Political Economy in the Riverine Midwest. Draft Ph.D. dissertation. Department of Anthropology, University of Kansas. Lawrence.

Reynolds, John D.

- 1979a The Grasshopper Falls Phase of the Plains Woodland. Kansas State Historical Society Anthropological Series No. 7. Topeka.

- 1979b Kansas Archaeology: Retrospect. Samuel Wendell Williston. Kansas Anthropological Association Journal 1:17-20.

Rohrbaugh, Charles L.

- 1974 Kaw Reservoir: The Central Section. Oklahoma River Basin Survey Archaeological Site Report No. 27. Norman.

Root, Matthew J.

- 1979 The Paleoethnobotany of the Nebo Hill Site. Plains Anthropologist 24:239-247.

Roper, Donna C.

- 1978 Settlement Subsistence Systems in the Truman Reservoir Area. Paper presented at the annual meeting of the Society for American Archaeology. 4-6 May 1978. Tucson, Arizona.

Schmits, Larry J.

- 1976 The Coffey Site: Environment and Cultural Adaptation at a Prairie Plains Archaic Site. Mid-Continental Journal of Archaeology Special Paper No. 1. Kent, Ohio.

Sears, P.B.

- 1961 A Pollen Profile from the Grassland Province. Science 134:2038-2039.

Sharrock, Floyd W. and Donald K. Grayson

- 1979 "Significance" in Contract Archaeology. American Antiquity 44:327-328.

Shelford, Victor E.

- 1963 The Ecology of North America. University of Illinois Press. Urbana.

Shippee, J.M.

- 1948 Nebo Hill, A Lithic Complex in Western Missouri. American Antiquity 14(1):28-32.

Slaughter, B.H.

- 1968 Animal Ranges as a Clue to Late-Pleistocene Extinction. In Pleistocene Extinctions: The Search for a Cause. Edited by Paul S. Martin and H.E. Wright. Yale University Press. New Haven, Connecticut. Pp. 155-167.

Socolofsky, Homer E. and Huber Self

- 1972 Historical Atlas of Kansas. University of Oklahoma Press. Norman.

South, Stanley

- 1977 Method and Theory in Historical Archaeology. Academic Press. New York.

Steinacher, T.L. and J. Ludwickson

- 1972 The Central Plains Tradition Reappraised. Department of Anthropology, University of Nebraska. Lincoln.

Swanton, John R.

- 1952 The Indian Tribes of North America. Bureau of American Ethnology Bulletin No. 145. Smithsonian Institution. Washington, D.C.

U.S. Department of Agriculture

- 1970 Soil Survey of Shawnee County, Kansas. U.S. Government Printing Office. Washington, D.C.
- 1975 Soil Taxonomy. Agricultural Handbook No. 436. U.S. Government Printing Office. Washington, D.C.
- 1977 Soil Survey of Douglas County, Kansas. U.S. Government Printing Office. Washington, D.C.

Webb, T., III and R.A. Bryson

- 1972 Late and Postglacial Climatic Change in the Northern Midwest, U.S.A.: Quantitative Estimates Derived from Fossil Pollen Spectra by Multivariate Statistical Analysis. Quaternary Research 2:70-115.

Wedel, Waldo R.

- 1959 An Introduction to Kansas Archaeology. Bureau of American Ethnology Bulletin No. 174. Smithsonian Institution. Washington, D.C.
- 1961 Prehistoric Man on the Great Plains. University of Oklahoma Press. Norman.
- 1978 Commentary. In The Central Plains Tradition: Internal Development and External Relationships. Edited by Donald J. Blakeslee. Office of the State Archaeologist, University of Iowa Report No. 11. Iowa City. Pp. 157-163.

Wendland, Wayne

- 1978 Holocene Man in North America: The Ecological Setting and Climatic Background. Plains Anthropologist 22:273-287.

Willey, Gordon R.

- 1966 An Introduction to American Archaeology, Volume One: North and Middle America. Prentice-Hall. Englewood Cliffs, New Jersey.

Willey, Gordon R. and Philip Phillips

- 1958 Method and Theory in American Archaeology. University of Chicago Press. Chicago.

Willman, H.B. and John C. Frye

- 1970 Pleistocene Stratigraphy of Illinois. Illinois State Geological Survey Bulletin 94. Urbana.

Witty, Thomas A., Jr.

1967 The Pomona Focus. Kansas Anthropological Association Newsletter 12(8):1-5.

1969 Notes on Flint Hills Archaeology. Kansas Anthropological Association Newsletter Vol. 14, no. 8. Topeka.

Wormington, H.M.

1957 Ancient Man in North America. 4th ed. Denver Museum of Natural History Popular Series No. 4. Denver.

Wright, H.E.

1970 Vegetational History of the Great Plains. In Pleistocene Environments of the Central Great Plains. Edited by Wakefield Dort Jr. and J. Knox Jones Jr. University of Kansas Press. Lawrence. Pp. 157-172.

Young, Wayne C.

1978 Kaw Reservoir - The Northern Section: Part II. Oklahoma River Basin Survey Archaeological Site Report No. 33. Norman.

INTERVIEWS

Blakeslee, Donald, Archaeologist at Wichita State University, Wichita, Kansas, was interviewed over the telephone by John D. Hartley of Iroquois Research Institute. 11 January 1980.

Carlson, Ross, a resident of Clinton, Kansas, was interviewed by James Schoen of Iroquois Research Institute. 11 April 1979.

Martin, Larry, a paleontologist at the University of Kansas Natural History Museum, was interviewed by Thomas Fahey of Iroquois Research Institute. 6 July 1978.

Johnson, Alfred E., Archaeologist at the Museum of Anthropology, University of Kansas, Lawrence, Kansas, was interviewed over the telephone by John D. Hartley of Iroquois Research Institute. 11 January 1980.

Rayl, Sandy, Archaeologist with the National Park Service, Southwest Cultural Resources Center, Santa Fe, New Mexico, was interviewed over the telephone by Cecil Brooks of Iroquois Research Institute. 23 June 1978.

Reid, Kenneth, Archaeologist at South Dakota State University, Vermillion, South Dakota, was interviewed over the telephone by John D. Hartley of Iroquois Research Institute. 11 January 1980.

Reynolds, John, Archaeologist with the Kansas State Historical Society, Topeka, Kansas, was interviewed over the telephone by John D. Hartley of Iroquois Research Institute. 16 January 1980.

Ziegler, Robert, an advanced graduate student at the University of Kansas, Lawrence, Kansas, was interviewed by Mark McCallum and Patricia Miller of Iroquois Research Institute. 4 April 1979.

MAPS

- 1857 National Archives. Record Group No. 49. Headquarter Office Plats. Plat of Wakarusa Valley, Kansas. Scale: 1 inch to 40 chains.
- 1955 U. S. Geological Survey. Globe, Kansas. Mapped, edited, and published by the Geological Survey. Scale: 1:24,000.
- 1958 U. S. Army Corps of Engineers. Clinton Reservoir. Prepared by the U.S. Army Corps of Engineers, Kansas City District. Kansas City, Missouri. File #A-3-150 through A-3-162. Scale: 1:7,200.
- 1967 U. S. Geological Survey. Lawrence West, Kansas. Mapped, edited, and published by the Geological Survey. Scale: 1:24,000.
- 1970 U. S. Geological Survey. Richland, Kansas. Mapped, edited, and published by the Geological Survey. Scale: 1:24,000.
- 1975 U. S. Geological Survey. Clinton, Kansas. Mapped, edited, and published by the Geological Survey. Scale: 1:24,000.

GLOSSARY

Alluvium	Sediments deposited by a stream or river along its banks or upon its floodplains.
Archaic Period	A period or stage in the prehistory of eastern North America characterized by a relatively diversified subsistence base. The Archaic concept was first applied to the eastern woodlands, but in recent years it has been expanded to include preceramic hunting and gathering cultures in the Plains and Great Basin. In the eastern Plains, the Archaic Period extends from roughly 6000 B.C. to B.C. 1.
Artifact	Any object or part of an object that was made or altered by human activity.
Ashlar Masonry	A type of masonry construction utilizing hewn or dressed stone laid with cleanly-cut joints. Ashlar is the opposite of rubble. Ashlar may be coursed or random.
Aspect	A term in the Midwestern Taxonomic System used to class together a number of related foci. The components grouped into an aspect share many traits in common although they are not as nearly identical as the components which comprise a focus.
Balloon Frame	A type of wood construction based on a structural "skeleton" of pre-cut, dimensioned lumber held together with machined nails. Few, if any, heavy bracing elements are used and the wall studs extend in one piece from foundation to roof. An American innovation dating to the 1930's, the balloon frame is still built today.
Bedrock	Rock that has undergone no major change through the effects of weathering and erosion at the surface of the earth. Bedrock is commonly overlain by surficial material.
Bench	A level or gently sloping erosion plane usually narrow and inclined toward a stream, valley, lake or sea. A bench is distinguished from a terrace by not being composed predominantly of alluvium, although it may have a thin cover of alluvium.

Brachiopod	A member of a group of marine animals which are symmetrical along the plane bisecting their closed shells and which have two dissimilar or unequal shells.
Bulb of Percussion	A bulbous projection on the ventral side of a flake adjacent and perpendicular to the striking platform.
Campsites	An archaeological site characterized by the presence of an artifact assemblage implying varied domestic activities occurring over an extended period.
Celt	A stone artifact which is shaped like a chisel or axe and is thought to have been used for woodworking activities.
Central Plains	The archaeological subarea of the Great Plains which is usually defined as centering in Kansas and Nebraska and occasionally defined as including the immediately adjacent portions of surrounding states.
Chenopod	A plant of the goosefoot family.
Chert	A compact, dense rock which is primarily composed of silicon and oxygen and which can be fractured and worked to form sharp edges. Chert was a preferred material for lithic tool making by aboriginal North Americans.
Clay	Any rock or mineral particles having a maximum diameter of less than 0.002 millimeter (0.00008 inch). Also, that class of sediment which contains 40% or more clay and not more than 40% of either sand or silt (USDA 1975).
Clovis Point	A fluted point defined from finds in the Southwest and Southern Plains regions but widely distributed throughout the continent. Possibly the earliest fluted point, it dates to approximately 12,000 B.P. and is associated with the Paleo-Indian/Big Game Hunting Tradition.
Colluvium	Sediments that have been deposited on a slope or at its base from further up the same slope by processes other than stream or river flow.

Complex	A group of related traits or characteristics that combine to form a complete activity, process or culture unit. Cultural complexes are usually identified by the presence of several key implements or tool types in association.
Component	An archaeological site or subdivision within a site that represents a local manifestation of a larger scale cultural unit such as a focus or aspect.
Cord Marked	The surface treatment of pottery resulting from the use of cord wrapped sticks or paddles to construct, shape or decorate a vessel.
Core	A stone nucleus from which flakes have been detached.
Cortex	The natural or weathered surface of flint or chert. Cortex can consist of a thin zone of chemically altered, weathered, patina or it may consist of the lithic material such as limestone that often surrounds beds of chert in an outcrop.
Coursed Construction	Wall construction exhibiting continuous, horizontal rows of stones, bricks or other masonry units.
Crinoid	A marine animal having a cup-shaped body with radiating arms attached to the top and a jointed, elongate stem attached to the base. The stem attaches the animal to the sea floor.
Cuesta	An unsymmetrical ridge with a steep slope on one side and a shallow slope on the other.
Cultural Horizon	A soil layer in a site which exhibits cultural debris or evidence of human occupation. Or, a large-scale archaeological cultural unit, often defined by a few key artifact types or styles, which has relatively little time depth but which appears to extend over a wide geographical area.

Culture	All that is non-biological and transmitted socially in a society. Culture includes artistic, social, ideological and religious patterns of behavior and techniques for adapting to the environment. An archaeological culture refers to the archaeological remains which are presumed to be the product of people having the same general culture.
Datum	A reference point for mapping a site from which measurements are taken.
Daub	The clay adhesive used to cover over the exterior of prehistoric houses, sometimes accidentally hardened by fire.
Debitage	Lithic debris produced as a by-product of tool manufacture.
Dentate Stamped Pottery	Pottery exhibiting a surface treatment resulting from the use of a stamping device which produces serrated or "tooth-like" impressions in the clay.
Diagnostic Artifact	An artifact belonging to a distinctive type which correlates with a specific time period or culture and can therefore be used as a time marker or cultural identifier.
Dissected Plain	A level plain which has been repeatedly cut by erosional action; a subdivided or differentiated plain.
Earth Lodge	The characteristic house type of the Plains Village Period in the Central Plains. An earth lodge is usually square or rectangular and partially below ground. It may have a central fireplace or hearth. The wooden framework is covered with mud and a small hole is left in the sloping roof for the fire smoke to exit.
Eastern Plains	The eastern edge of the Central Plains area: eastern Kansas and western Missouri.
Euro-American	Associated with Americans of European descent.
Feature	A stationary physical attribute of an archaeological site such as a hearth or storage pit.

Field Chert	Naturally occurring fragments of weathered chert which have not been altered or transported by man.
Floodplain	The area bordering a stream over which water spreads in time of flood.
Flotation	A method of extracting minute floral, faunal and artifactual remains from a soil sample by means of floating the material to the surface of a container of water.
Fluted Point	A biface weapon point with one or both faces thinned at the center from the base toward the tip. The thinning permits insertion into a shaft that has been split to receive it.
Focus	A term originally used in the Midwestern Taxonomic System (MTS) to denote a small archaeological cultural unit comprised of a number of similar sites or components. In MTS usage, the term focus carries no temporal or geographic significance but is instead a formal or typological characterization. The focus is the most specific level of classification in the MTS; foci in turn are combined into aspects.
Forb	An herb other than grass.
Formation	A unit of rock which has distinct physical characteristics and is mappable in the field.
Fossiliferous	Possessing the fossil remains of ancient plants or animals.
Full-Grooved Axe	A stone implement with a sharp cutting edge to be used for chopping or crushing tasks. A groove completely encircles the axe and is used for hafting to a handle.
Fusulinid	An extinct, one-celled marine animal with a small shell that is cylindrical in shape and tapered at both ends.
Glacial Till	A mixture of soil and stone deposited by a retreating glacier.

Glacio-Fluvial Sediments	Sediments which have been deposited by the combined action of ice and water.
Gravel	Any rock or mineral fragment having a diameter greater than 2.0 millimeters (0.08 inches) and less than 7.6 centimeters (3 inches) (USDA 1975).
Ground Stone	A stone tool technology which involves shaping by grinding, as opposed to flaking, resulting in the production of a smooth surface without distinct flake scars.
Hafting Area	The portion of a knife, scraper or projectile point which was bound to a handle or shaft.
Hearth	A pavement lined with clay or stones or a depression used for fire.
Hematite	An iron-ore mineral used for coloring purposes that is either red or brown.
Hide Working	The skinning, cleaning, scraping and processing of animal skins for various purposes.
Hopewellian	Pertaining to Hopewell culture. Hopewell culture is a particularly spectacular manifestation of Middle Woodland culture characterized by elaborate mortuary customs, extensive earthworks, and widespread trading in rare goods. Classic Hopewell culture is centered in the Ohio Valley, but scattered evidence of Hopewellian contacts occurs in the eastern Plains and other portions of North America outside of the core area. Hopewell endures from <u>circa</u> 500 B.C. to A.D. 500.
Hunting and Gathering Economy	A subsistence pattern in which all food and raw materials are obtained by hunting wild animals and gathering wild plants.
Illinoian Glacial Stage	The second to the most recent period of glaciation in continental North America.
<u>In Situ</u>	Refers to "in place" conditions, as when an object is found in the place where it was first placed or formed, not having been subsequently redeposited.

Lanceolate	Refers to a lance shaped object characteristically tapering to a point at its apex and sometimes at its base.
Lip Fold	The rim of a pottery vessel which is folded on itself during manufacture.
Lithic	Pertaining to or composed of stone.
Loam	Soil or sediment material that contains seven percent to 27% clay, 28% to 50% silt and less than 52% sand (USDA 1975).
Midden	Accumulated refuse indicating former human habitation. Midden debris usually contains decayed organic material, bone fragments, and artifacts.
Midwestern Taxonomic System (MTS)	A system developed in the 1930's to hierarchically classify the prehistoric remains and cultures then known in the eastern United States (McKern 1939). The MTS is a purely descriptive classification and originally no attempt was made to place the categories into a temporal or geographical perspective.
Mississippian Period	A period or stage in the prehistory of eastern North America characterized by the widespread cultivation of maize, beans, squash and other food crops, the rise of large settlements and chiefdoms, and increasing social stratification. Mississippian culture developed to the greatest extent in the central Mississippi Alluvial Valley, although related cultures existed in many areas of the central and southeastern United States. The Mississippian Period spans roughly A.D. 1000 to A.D. 1500.
Modified Point	A projectile point that has been reworked, usually after breakage, to produce a new bifacial tool.
National Register of Historic Places	The Register was authorized under the 1935 Historic Sites Act and expanded under the 1966 Historic Preservation Act. It was designed to be an authoritative guide to be used by Federal, state and local governments, private groups, and citizens to identify the nation's cultural resources of local, state and national significance, and to indicate what properties should be considered for protection from destruction or impairment.

Ossuary	A place where human bones are buried after the flesh has been removed.
Paleo-Indian Period	The earliest well-documented period of human occupation in North America. The Paleo-Indian Period is characterized by several varieties of fluted or lanceolate projectile point styles and dates from <u>circa</u> 12,000 B.C. to 6000 B.C. The Paleo-Indian Period is best known from stratified sites in the Southern and Western Plains, where it is characterized by an economic emphasis on big-game hunting.
Paleosol	A soil that is a product of past climate, flora and fauna no longer extant in the area.
Phase	A term in the Midwestern Taxonomic System which groups together similar aspects. Or, a term used in the Willey-Phillips (1958) classification system to denote an archaeological culture which occurs in a geographically limited area for a relatively short span of time. Although there has been a tendency to equate this use of the term with "focus" in the MTS, the two are not truly interchangeable due to differences in the assumptions of the two classification systems.
Plains Woodland Period	A period in Plains prehistory roughly equivalent to the Woodland Period in the eastern United States. The period is characterized by the widespread introduction of ceramics and by the initial use of small, corner notched projectile points. Evidence for plant cultivation is limited for the Plains Woodland Period, but some horticulture may have been practiced. The span of the Plains Woodland Period in the eastern Plains ranges from <u>circa</u> A.D. 0 to A.D. 1000.
Plains Village Period	A period in Plains prehistory characterized by the increasing cultivation of plants, including maize, squash and beans; semi-sedentary villages or hamlets; and the introduction of small, triangular, unnotched or side notched projectile points. In Kansas, the Plains Village Period is largely exemplified by sites of the Central Plains tradition, which endures from roughly A.D. 1000 to A.D. 1500.

Pleistocene Epoch	The period of time extending from two and one-half million years ago until the present (Willman and Frye 1970).
Post Mold	An archaeological feature consisting of the shape and discoloration of the earth which indicates the remains of a wooden post.
Provenience	Three dimensional data concerning the location of archaeological material.
Quaternary Period	The period of time beginning approximately two and one-half million years ago and extending to the present day (Willman and Frye 1970). The Pleistocene Epoch is its only subdivision on the next level of classification.
Research Design	The application of scientific method to the solution of a specific problem or set of problems. The research design commonly includes a statement of the problems and the strategy for obtaining answers to them; hypotheses may be formulated and data are sought to support or disprove them.
Residual Chert	Applies to chert which is left after the disintegration and dissolution of the underlying bedrock by weathering.
Residuum	The material remaining after the <u>in situ</u> dissolution, disintegration and decomposition of bedrock at the surface due to weathering.
Rocker Stamped Pottery	Pottery exhibiting a ceramic decoration technique in which a stamp fashioned from the edge of a shell or some similar object is rocked across the surface of the vessel so as to produce a design. It is a diagnostic Hopewellian trait.
Sand	Any rock or mineral fragment whose maximum diameter ranges from 0.05 to 2.0 millimeters (0.002 to 0.08 inches). Also, that class of sediment that contains 85% or more sand and not more than 10% clay (USDA 1975).

Selective Sample	In this report, selectively sampled collections include those materials which result from either (1) less than total recovery within a specific provenience unit or (2) recovery of materials outside of a strictly defined provenience unit, such as the collection of an isolated surface artifact.
Settlement Pattern	The spatial arrangement of a specific culture's sites as classed by size, function and location.
Sherd	A pottery fragment.
Shrink Swell Potential	The potential of some clays and soils alternately to expand when moist and shrink when dry.
Silt	Any rock or mineral fragment whose maximum diameter ranges from 0.002 to 0.05 millimeter (0.00008 to 0.002 inches). Also, that class of sediment that is 80% or more silt and not more than 10% clay (USDA 1975).
Site	The basic spatial unit, either large or small, studied by the archaeologist, at which evidence of human habitation, activity or action has survived.
Slash and Burn Agriculture	A system of shifting agriculture in which fields are cleared of vegetation which is then burned. Fields are planted without fertilizer for as long as they remain productive and then stand fallow while new plots are prepared and planted. Slash and burn agriculture requires utilization of a relatively large area and often results in shifting populations.
Slopewash	Sediment that is being or has been moved down a slope mainly by the action of gravity assisted by unchannelized water flow.
Soil Profile	A succession of soil zones or horizons beginning at the surface that have been altered by normal soil-forming processes, particularly leaching and oxidation.
Soil Reaction	The acidity or alkalinity of a soil, measured on a logarithmic scale from 1 to 14 with the numbers below 7 being acid, the numbers above 7 alkaline, and 7 neutral.

Special Activity Area	An area within a site which was the location of a definable activity or complex of activities as indicated by recovered artifacts.
Spur	A projection of a ridge or other area of high elevation into an area of lower elevation with the projection connected to a larger landform on only one side.
Sterile Soil	Soil which does not contain archaeological material.
Stratified	Having cultural or natural deposits which are layered, with each layer presumably being older than the one immediately above it.
Striking Platform	A prepared surface of a core from which flakes can be easily removed.
Subsistence Pattern	A method for obtaining the necessities of life by organized exploitation of the environment.
Systematic Sample	In this report, systematically sampled collections include those materials which result from collecting all material within a strictly defined provenience unit. These collections include materials recovered from shovel tests, test excavations and intensively collected surface grid units.
Temper	Any hard material added to clay paste so as to improve its modeling or firing properties. Usually this material is either sand, grit, shell, plant fiber, fired clay or dried clay.
Terrace	A relatively flat, horizontal portion of the land surface bounded by a relatively steep ascending slope on one side and a relatively steep descending slope on the other. As used in this report, a terrace is of alluvial origin.
Tradition	A large scale archaeological classificatory unit which is usually defined as enduring or developing over a relatively long period of time in a geographically limited area.

Trait	A distinguishing feature or quality characteristic of a culture, phase or tradition, such as a distinctive stone tool.
Uniface	A lithic artifact which is morphologically defined as having been flaked on one face.
Utilized Blade	A blade that exhibits fracture scars or marginal retouch along one or more edges, probably as a result of utilization.
Wattle	A structure made of interwoven branches, reeds or other similar material.
Wisconsinan Glacial Stage	The last of the Pleistocene glaciations. It began about 75,000 years ago and ended about 7,000 years ago (Willman and Frye 1970).
Woodland Period	The period in eastern North American prehistory characterized by the introduction of ceramics and increased utilization of cultivated plant foods. As a concept for ordering archaeological data, Woodland is most useful in the riverine valleys of the Midwest and East, where it is dated from <u>circa</u> 1000 B.C. to A.D. 1000. In some areas, Woodland culture endures to European contact.
Zoned Pottery	Pottery exhibiting a decorative treatment confined within well delineated zones. Certain kinds of zoned pottery are characteristic of Hopewellian or Hopewellian-influenced cultures.

APPENDIX A

SCOPE OF WORK
and
RECORD OF PRE-NEGOTIATION
MEETING HELD ON 23 JANUARY, 1978

MARKED-BR

12 December 1977

SCOPE OF WORK
ARCHEOLOGICAL MITIGATION
CLINTON LAKE, KANSAS
WAKARUSA RIVER

1. INTRODUCTION

a. The Corps of Engineers is currently constructing the Clinton Lake Project on the Wakarusa River in Douglas County, Kansas. There will be about 22,250 acres of land acquired for project purposes of which approximately 7,000 acres will be inundated by the conservation pool.

b. Several studies dealing with the archeological resources in the project area have been funded by either the Corps of Engineers or the National Park Service. The following is a list of the reports:

1966 Alfred Johnson, "Appraisal of the Archeological Resources of the Clinton Reservoir, Douglas, Osage, and Shawnee Counties, Kansas."

1968 Alfred Johnson, "Archaeological Investigations in the Clinton Reservoir Area, Eastern Kansas."

1977 M. E. Chambers, S. K. Thompkins, et al., "The Cultural Resources of Clinton Lake, Kansas: An Inventory of Archeology, History and Architecture."

c. The work defined herein to be performed by the Contractor is called for in the National Historic Preservation Act of 1966 (P.L. 89-665) and is authorized for funding under Public Law 86-523 as amended by Public Law 93-291. The work defined herein will provide documentation evidencing compliance with Executive Order 11593 "Protection and Enhancement of the Cultural Environment" dated 13 May 1971, Section 2(a).

2. SCOPE

This work encompasses the scientific testing and either a) further testing or b) excavation of specified sites within the project area, and the study of the materials recovered. The Contractor and Contractor's staff shall conduct this study in a professional manner, using accepted methodology. The Contractor shall be responsible for the preparation of a report of findings, fulfilling the requirements stated below.

3. STUDY APPROACH

a. Problem Orientations. Results of archeological survey in the project area and previous investigations in the area have identified sites that will be most affected by the project construction, inundation, and shoreline erosion. Past work sponsored by National Park Service concentrated on mitigation of sites affected by dam construction. This work is to be oriented toward mitigation of sites affected by the lake itself and by park development. Recommendations for a basic orientation for investigation of these sites have been detailed in the 1977 report:

"The . . . sites constitute the "upland component" of the Wakarusa Valley Settlement system, and provide an important resource base for the study of behavior patterns relating to the seasonality and scheduling of subsistence activities, patterns of settlement and movement within the drainage system, population demographics, and lithic technology. The upland sites also offer the opportunity for examining the systemic interrelationships of resource availability, selection, and exploitation in this biophysiological zone."

The mitigation of adverse impacts on an archeological site can be accomplished by scientific investigation directed toward recovery of data and cultural material. The mitigation action includes limited analysis of materials recovered to the extent that the report will be of value to archeologists in future research on the materials. Proper curation of the recovered materials, and documentation of data is vital. Mitigation does not include funding of such future research, but does require making these materials available for research.

b. Methodology. In order to investigate the sites and provide data directed toward the problems presented, the Contractor shall use accepted and appropriate field and lab methods, including but not limited to the following:

(1) Test the following specified sites, as recommended in the 1977 report:

14D03	14D0126	14D0127	14D0128	14D0129	14D0130
14D0131	14D0132	14D0133	14D0134	14D0135	14D0137
14D0140	14D0144	14D0145	14D0148	14D0309	14D0310

Additive testing or excavation of the above listed sites which as a result of this initial testing will have demonstrated potential to provide data which will best answer the problems set within the study approach, shall be conducted as authorized by the Government under the provisions of section 5a(1) below and not included as part of the original contract fee.

(2) Collect material to provide supportive data to discuss the problems presented above.

(3) Perform ancillary studies (geological, botanical, and zoological) when applicable.

(4) Photograph phases of field work, including black and white photos and illustrate diagnostic features and artifacts by either black and white photos or line drawings.

(5) Record provenience of materials and features, including maps and graphs when applicable.

(6) Collect materials for absolute dating (e.g. radio-carbon) when appropriate.

(7) Clean, identify, and curate all recovered materials; and catalog chronologically diagnostic artifacts and other selected representative tool types.

(8) Make a preliminary analysis of cultural materials to provide a base for future use by the archeological profession as data for research.

(9) Perform all measurements using the metric system.

(10) Coordinate installation of site references for National Park Service (Santa Fe) Inundation Study if appropriate.

4. SCHEDULE OF WORK

a. Coordination and Meetings. The Contractor shall pursue the study in a professional manner to meet the schedule specified. Prior to the initiation of actual field work, the Contractor shall coordinate all field schedules and activities with the appropriate project cultural resources coordinator. During the course of the study, the Contractor shall submit a monthly progress report. In addition, the Contractor shall review the progress of the work performed with the Corps of Engineers, and the State Historic Preservation Officer (SHPO) at meetings as follows:

(1) Coordination meetings with the Government to include at least one during the field season at field headquarters, and one during the laboratory and analysis period at the Contractor's facilities.

(2) One meeting, early in the report-writing phase, at the SHPO's office with representatives of the SHPO, the Contractor, and the Government to discuss findings and report content.

(3) Meeting at the Kansas City District Office to discuss the review of the draft copy of the report.

b. Report Content and Schedule.

(1) A report of findings shall be prepared by the Contractor and his staff. The main text of the report shall be written in a manner suitable for reading by persons not professionally trained as archeologists. Detailed presentation and discussion of data of interest to the archeological profession shall be included in a second part of the report, and/or in appendices. The report is intended to be of use and interest to the general public as well as of value to the profession. Use of illustrations is encouraged.

(2) The report shall be authored by either the principal investigator or the project director. If the project director is not the author, he shall review and edit the report prior to submission of the draft and final versions.

(3) Thirteen (13) copies of a complete draft of the report shall be submitted to the Contracting Officer for purposes of Governmental review within 15 months of notice to proceed. (If excessive inclement weather or other delays occur, this date may be extended to one mutually agreed upon between the Government and the Contractor.) In addition, the Contractor shall send the draft report and Scope of Work to three qualified professionals not associated with a State or Federal governmental agency for peer review of the merits and acceptability of the report. After the review period of approximately two (2) months, the Government will return the draft to the Contractor, the Contractor shall complete necessary revisions and submit the final report within 60 days after receipt of the reviewed draft. The Contractor shall submit one set of originals and two copies of the final report of findings. The copies shall include all plates, maps, and graphics in place so that they may be used as patterns for assembling the final report. The Government will edit the final report and after approval will reproduce this report and provide the Contractor ten (10) copies for personal use, plus two (2) copies for each major contributing author.

(4) The report shall include the following:

- a. Description of the study area;
- b. A discussion of each site investigated and the analysis data mentioned above. A detailed description of sites and a limited discussion of the recovered artifacts, presented both in support of the discussion in the text and also as valuable data for professional use of the report;
- c. A detailed description of the methods used in field and lab work;

d. Recommendations which will comprise a cultural resources management program for the operating project, including any suggestions for the archeological portion of the interpretive program;

e. Illustrations, photos, maps, tables and graphic representation of data appropriate to the text, such as illustrations of diagnostic artifacts;

f. Maps of the project area with known sites, indicating which excavated, which tested, cultural affiliations, and other pertinent information. (Color overlay reproduction is available.) Maps for inclusion in the report must be drawn in a manner that does not show exact site locations;

g. A glossary of terms;

h. Reference section with all sources referred to in text or used for report, personal communications, interviews, bibliography, etc.;

i. Copies of all correspondence pertaining to the review of the draft report. These are to include the comments of the State Historic Preservation Officer, National Park Service, and at least three reviews by professional archeologists not employed by a Governmental agency together with responses to each of the comments given. The Scope of Work is to be included in this section; and

j. Listing of principal investigators and their qualifications, and a list of field and lab personnel, as an appendix.

(5) Final originals shall be typed single-spaced on one side of paper with the margins set for reproduction on both sides of 8x10-1/2-inch paper. Margins on the side of the page to be bound (left side for printing on front of page, right side for printing on back of page) shall be at least 1-1/4 inches. Opposite margins (on free edges of pages) shall be at least 3/4 inch wide. All pages shall be numbered. All text and illustrations shall be of reproducible quality. The report shall be accompanied by a completed NTIS form.

c. Other Information. Four copies of materials not suitable for publication in the report shall be submitted with the draft. These materials include excavation data forms, feature maps, large amounts of statistical analysis data, repetitious photographs, a complete listing of all materials recovered, and other documentation not of interest to most readers of the report. Averages, graphs, or summaries of statistical data are to be included in the publishable report. Publication of bulk statistics in the report is not appropriate.

d. Materials Not for Release. Materials dealing with exact site locations are considered confidential and are not published or released. Materials which shall accompany the report but not to be included in the report include:

(1) Detailed locational maps, by tract, of the sites. USGS maps and/or base maps provided by the Government; and

(2) Survey forms for any newly recorded sites discovered incidental to this contract.

e. Storage of Materials. Attached to the letter of transmittal for the final report shall be a listing of all cultural materials found during the field investigations, and a Certificate of Authenticity for the materials. These collections shall be properly stored in containers clearly marked "Property of the U.S. Government, Kansas City District Corps of Engineers." These materials may be stored in the Contracting Firm's laboratories for use in future studies, or at a repository mutually agreed upon by the Government, the Contractor, and the State Historic Preservation Officer. Retrieval of these materials by the U.S. Army Corps of Engineers for use by the Government is reserved. If the materials are to be removed from the curatorial facilities, this action must be approved by the Contracting Officer.

5. FURTHER RESPONSIBILITIES OF THE CONTRACTOR AND GOVERNMENT.

a. Contract Modifications.

(1) Because of the complex nature of the prehistoric and historic resources being tested, it is recognized that additional testing and/or excavation may be required. If, in the opinion of the Contracting Officer, such additional work is required, the Contract will be modified pursuant to the provisions of Article 2, Changes, of the contract.

(2) The work identified in this document shall be complete in itself, incorporating the appropriate testing effort described in Chambers, Tompkins, et al, 1977. There will be no assurance from the Government that additional work will follow, nor should such work be anticipated.

b. Data Availability. The Government shall provide the Contractor with available background information, maps, remotely sensed data reports (if any), and correspondence as needed. In addition, the Government shall provide support to the Contractor regarding suggestions on data sources, format of study outline and report, and review of study progress.

c. Right of Entry and Crop Damages. The Contractor shall have right-of-entry on all property owned by the Government. Compensation for damages to crops planted on Government property leased to various individuals shall be the responsibility of the Contractor.

d. Publication. It is expected that the Contractor and those in his employ, may during the term of the contract, present reports of the work to various professional societies and publications. Outlines of those reports dealing with the work sponsored by the Corps of Engineers shall be sent to the Kansas City District Office for review and approval prior to presentation or publication. Proper credit shall be given for the Corps sponsored work, and the Corps shall be furnished six (6) copies of each such paper and/or published report.

e. Court Testimony. In the event of controversy or court challenge, the Contractor shall make appropriate expert witnesses available and shall be placed under contract to testify on behalf of the Government.

f. Safety Requirements. The Contractor shall provide a safe working environment for all persons in his employ as prescribed by EM 385-1-1, "General Safety requirements," a copy of which will be provided by the Government.

g. Evaluation for National Register. The Contractor shall evaluate sites investigated to determine their suitability for nomination to the National Register of Historic Places; the Contractor shall make recommendations to the Government for the preservation, management and nomination of those sites which appear to qualify. If a potential National Register site exists, the Contractor shall prepare all National Register forms, and submit them to the Corps for review and processing.

6. STAFF AND FACILITY REQUIREMENTS.

a. Project Director. The person in charge of this project must have the doctorate or an equivalent level of professional experience as evidenced by a publication record that demonstrated experience in field project formulation, execution and technical monograph reporting.

b. Archeologist. The minimum formal qualifications for individuals practicing archeology as a profession are a BA or BS degree from an accredited college or university, followed by 2 years of graduate study with concentration in anthropology and specialization in archeology during one of these programs, and at least two summer field schools or equivalent under the supervision of archeologists of recognized competence. A Master's thesis or its equivalent in research and publications is highly recommended, as is the Ph.D degree. The individual must be knowledgeable in the archeological sequence of the Central Plains region.

c. Consultants. Personnel hired or subcontracted for their special knowledge and expertise must carry academic and experiential qualifications in their own fields of competence.

d. Equipment and Facilities. The Contractor also must provide or demonstrate access to:

(1) Adequate permanent field and laboratory equipment necessary to conduct operations defined in the Scope of Work; and

(2) Adequate laboratory and office space and facilities for proper treatment, analysis, and storage of specimens and records likely to be obtained from the project. This does not necessarily include such specialized facilities as pollen, geochemical, or radiological laboratories, but does include facilities sufficient to properly preserve or stabilize specimens for any subsequent specialized analysis.

official copy
[Signature]

MRKED-BR

25 July 1978

Appendix A Changes
Contract DACW41-78-C-0054

Archeological Mitigation
Clinton Lake, Kansas

RECEIVED
SEP 18 1978

THE ARCTIC COMPANY, LTD.
IROQUOIS RESEARCH INSTITUTE

Appendix A of the contract shall be amended as follows:

1. In paragraph 2. SCOPE, the following sentence is added:

The work also involves conducting an intensive archeological survey of areas above elevation 857 m.s.l., not covered in previous surveys within the project fee acquisition boundaries, including notation of paleontological sites if they appear to relate to a time of early human occupation of the area, and testing of the newly recorded archeological site 14DO154 (adjacent to and formerly recorded as part of 14DO3) to determine extent of site, cultural affiliation, National Register significance, project-induced impacts, and mitigation needs.

2. In paragraph 3. STUDY APPROACH b. Methodology, add the following subparagraphs:

(11) Conduct field studies as described above in Section 2.

(12) Delineate areas surveyed on base maps provided by the Government. Shoreline areas which have rock outcrops and do not appear to be susceptible to future erosion shall be indicated on the base maps.

(13) Delineate locations of newly recorded sites on a) base maps showing known sites, b) USGS quads and c) Real Estate tract maps.

(14) Photograph each new site and prepare approved State archeological survey sheets for newly identified sites. Numbers for the sites are to be coordinated with the Kansas State Historical Society.

(15) Collect a surface sample of cultural materials from each new site.

(16) Perform limited tests on new sites which will be adversely impacted by the project to determine their limits and National Register significance.

(17) Evaluate each new site and make recommendations for preservation and management, including statements of interpretive potential, if any.

(18) Prepare nomination forms and make mitigation recommendations for those archeological sites at the project which appear to be eligible for nomination to the National Register of Historic Places. Supportable justification must be presented for all mitigation recommended under this contract as modified.

3. In paragraph 4. SCHEDULE OF WORK a. Coordination and meetings, add the following subparagraphs:

(4) One additional coordination meeting at field headquarters during the survey phase.

(5) One meeting at the Contractor's office after the review of the draft and during the preparation of the final report.

4. In paragraph 4. SCHEDULE OF WORK b. Report Content and Schedule, add the following sentence to subparagraph (1):

The report of findings for the supplemental work shall be included in the basic contract report which will function as a supplement to the cultural resources survey report of 1977 (Chambers, Tompkins, et al). Content and format shall be consistent with that of the previous inventory volume. The narrative description of field work shall include a research design with justification of areas selected for survey and testing.

5. In paragraph 4. SCHEDULE OF WORK b. Report Content and Schedule, delete the first sentence of subparagraph (3) and insert the following sentence in lieu thereof:

Thirteen (13) copies of a complete draft of the report, including additional requirements provided herein, shall be submitted to the Contracting Officer for purposes of Governmental review within twenty-four (24) months after receipt of notice to proceed.

6. In paragraph 4. SCHEDULE OF WORK c. Other Information, add the following sentence:

Site forms and location maps for new sites shall accompany the background information but shall not be included in the draft or final report.



RECORD OF PRE-NEGOTIATION FOR CLINTON TESTING, HELD ON
JANUARY 23, 1978, MONDAY, 10:00 A.M., IN ROOM 801C,
CORPS OF ENGINEERS, KANSAS CITY, MISSOURI, WITH IROQUOIS
RESEARCH INSTITUTE.

Representing the Government (COE, Kansas City District):

Ferd Giorza	Mary N. Lucido
Roberta Comstock	Pat Moberly
Dick Taylor	

Representing Iroquois Research Institute:

Charles H. LeeDecker
Bernard W. Poirier

A draft Statement of Work (MRKED-BR) dated 12 December 1977 and entitled "Archeological Mitigation, Clinton Lake, Kansas, Wakarusa River" was reviewed by the seven individuals attending the meeting.

The following changes were agreed upon by all parties:

Pg. 2. Section 2. Scope. The first sentence was changed to read: "This work encompasses the scientific testing and either (a) further testing or (b) excavation 'of specified sites...'"

Pg. 3. Section 2.b. This paragraph was rewritten and transferred in its entirety to replace Section 5.a.(2) on page 12. It now reads: "The work identified in this document shall be complete in itself, incorporating the appropriate testing effort described in M. E. Chambers, S. K. Tompkins, et al., 1977. There will be no assurance from the Government that additional funding will follow, nor should such work be anticipated."

All sides agreed on the change above that the fee to be decided upon should have definite parameters, i.e. so many cubic meters to be excavated as testing.

Pg. 3, Section 3.a. It was agreed that the quote sufficed as a research design objective and that inadequate replications at lower elevation would be tested to justify a goal of "relationships of upland sites to those at lower elevations that were previously excavated." This phrase was deleted.

Record of Pre-Negotiation for Clinton Testing

Page 2

Pg. 4, last paragraph of 3.a.

Considerable discussion ensued related to limitations in the detail of the final report and in the minimal data analysis required. Mr. Taylor stressed that scholars and researchers may later delve into further detail at anytime to develop thesis or dissertation material which will be saved by the efforts contemplated by this contract.

Reference was made to Section 3.b.(1) and 3.b.(7) and 3.b.(8) and 4.b.(4)b. (pg. 8), where each subsection should be modified to reduce or minimize the analysis and report requirements insofar as to limit the cataloguing of artifacts to those offering "chronological diagnosis" and to "selected representative tool types," and to select language in the scope-of-work to limit the contract to testing of the eighteen sites listed, in 3.b.(1). Any further testing or additive excavation would be authorized through specific contract changes as described in Section 5.a.(1) on page 12 (whose language was also clarified and simplified).

Section 5.e. (Page 14). It was agreed that expert testimony would be provided by Iroquois and paid for by the Government by a separate and additive fee through a change order, contract amendment, or purchase order, whichever was appropriate and reasonable.

Section 3.b.(1) on page 4 was deleted in its entirety since it did not reasonably apply and the following subsections were renumbered to reflect this deletion.

Section 4.c. (page 10). It was agreed to delete the sentence requiring the storage of artifact data on computer tapes or in microform. Both parties agreed that in 1979 it would be clear whether such a storage effort would be required. The proper time to address this need, if it existed, would be early in the report-writing phase (Section 4.a.(2), page 7). Since about 52 artifacts are expected per cubic meter excavated, it was felt that the need may not exist since 20 cubic meters may yield only 1,040 artifacts.

Contractual boilerplate and detailed costing outlines were given to Iroquois. Iroquois asked how to address the issue of basic hourly rates in 1979, beyond the overhead analysis period. The Government advised Iroquois to state its rationale which should be reasonable and clearly defined.

Record of Pre-Negotiation for Clinton Testing

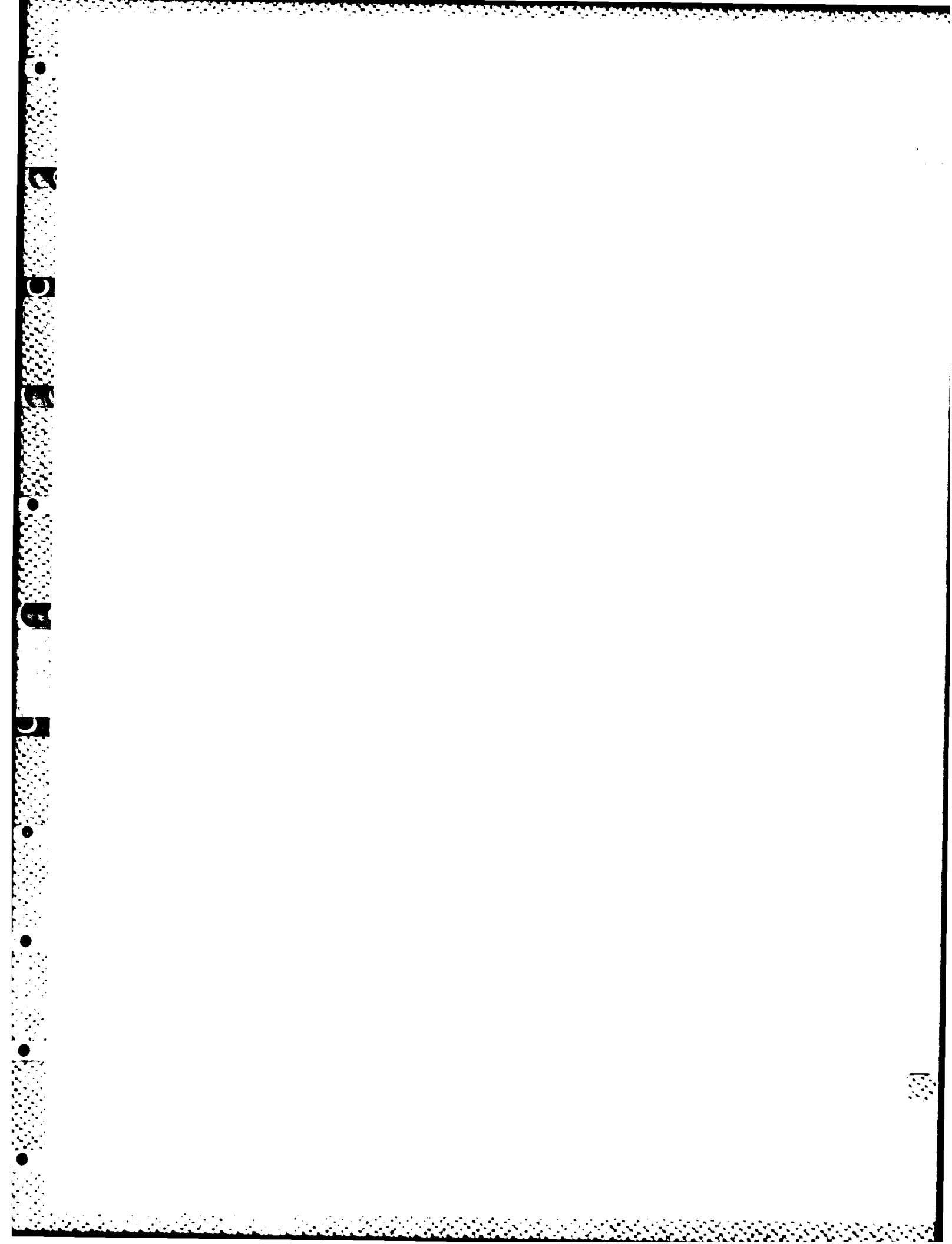
Page 3

Page 8, paragraph (3). Changed "qualified professionals not associated with a State...." to "qualified professionals not employed by a State...."

Entire text all references to "the Corps" changed to "the government."

APPENDIX B

CORRESPONDENCE





THE
GEORGE
WASHINGTON
UNIVERSITY

Department of Anthropology / Washington D.C. 20052 / (202) 994-6075

September 18, 1979

RECEIVED

Bernard W. Poirier
Director

Iroquois Research Institute
3251 Old Lee Highway, Suite 414
Fairfax, Virginia 22030

Dear Perry:

I have read the draft copy of Iroquois Research Institute's Inventory and Evaluation of Archaeological Resources of Clinton Lake, Pennsylvania, and Mitigation of Potentially Eligible Sites with Considerable Interest, and I believe it is an excellent piece of work. The cultural chronology is as complete as possible under the circumstances, the summary of previous work is thorough; and the cultural-ecological data fills some especially troublesome gaps in our understanding of Central Plains Archaicology.

There are a few points in the methodology section which I believe could be clarified. The term "settlement" used in reference to settlement pattern analysis should be more precisely defined and delineated, especially in reference to "site". Settlement types, as used in describing the sites (village, hamlet, composite, etc.), would also gain in significance if they were more concisely defined in the text. While the testing and sampling procedure employed in the field seems appropriate, I think a brief discussion of why this particular set of techniques was chosen from the wide range of possible tests.

Another small point, but one which you may wish to revise slightly: the functional analysis of settlement type included in the site descriptions is a very good idea, but I am not certain that some of the statements in the text can be made with a high level of confidence. For example, on page 74 and again on page 111, a short term occupation is inferred from a very low number of test pits and artifacts. I'm inclined to agree with the inferences, but the possibility of error seems large, which should be clearly stated.

These are really rather minor criticisms of an otherwise excellent monograph. The mitigation proposals seem both sound and reasonable, and again, I think the cultural-environmental data is outstanding.

Bernard W. Poirier
Page 2

I was happy to have been associated with the earlier phases of research at Clinton Lake, and I look forward to seeing the finished product.

Best regards,

Ron
Robert L. Humphrey
Professor

RECEIVED

SEP 19 1979

THE ARCTIC COMPANY LTD.
ARCTIC RESEARCH INSTITUTE

Columbia University in the City of New York | New York, N.Y. 10027
DEPARTMENT OF ANTHROPOLOGY

Schinnerhorn Hall

Sept. 23,

Dear Bernie

Thanks for your letter of Sept. 13th and
the Clinton Lake, Kansas draft copy.

As to suggestions for improvement I
picked up "historic artifacts" - would be
useful to know what they are? Bottles,
bell buckle etc. - or is this of no importance.
Secondly, there is no mention of the
River Basins Survey, Smithsonian Inst. work
in the area. I did the Truttle Creek
Reservoir near Lawrence (as I recall) back about
1954 by airplane + ground - there is a gov't
report on it + a later excavation report by
someone else from my findings.

RECEIVED

SEP 27 1979

THE ARCTIC COMPANY, LTD.
IROQUOIS RESEARCH INSTITUTE

Thanks for the draft copy.
Regards,

Dolf Beck

Columbia University in the City of New York | New York, N.Y. 10027

DEPARTMENT OF ANTHROPOLOGY

Bonomo Hall

Bernard Poirier
Iroquois Research Inst.
3251 Old Lee Highway
Fairfax, Va. 22030

RECEIVED OCT 4 1979
THE ARCTIC COMPANY LTD
IROQUOIS RESEARCH INSTITUTE

Dear Bernie,

The check and the copy of my letter of last year arrived this morning with many thanks. Supplemental income is just the thing now, even with wives working. I forgot that you had asked me to be a consultant on the Clinton Reservoir, Kansas.

My own work on survey was called, "Appraisal of the Archaeological and Paleontological Resources of the Tuttle Creek Reservoir, Marshall, Pottawatomie and Riley Counties, Kansas," Jan. 1953, Missouri Basin Project, Smithsonian Institution. This area is in the neighborhood of Manhattan, Kansas. I did six surveys in Kansas in the space of 1 year (1952) plus flying surveys in Nebraska, South Dakota through to Wyoming. I bring up these reports because in bulk, they do not measure half as much as the Clinton report. The latter is a monumental work. I would suggest that the frontier history section on p. 21 be expanded, in view of the fact that there are historical finds in the collections. In other words, more historical archaeology, if one of your staff can do it. Re. the bibliography, I do not see Donald Lehmer's "Intro. to Middle Missouri Archaeology", Natl. Park Service, Anthropol. Papers No. 1, Washington, Mich., ought to be referenced. Also general literature, such as the old standby, Walter Prescott Webb, "The Great Plains" 1931 (Grosset and Dunlap). I find some of the meticulous detail measurements ~~and~~ —

Dr. Solecki's review of the original draft was generally favorable, so detailed responses are not required. Dr. Solecki's request for an expanded historic archaeology section was not followed in view of the fact that all of the historic sites described in the original report date to the 20th century and are not associated with the early historic occupation in the area.

Oct. 1, 1979

See Fig. 16, for instance, where the depth of a cut is down to 32 cm.
~~and below~~
I would ~~say~~ "about 32 cm.", for instance, because certainly the cut
was not machined accurate. But all in all, I find the report
impressively turned out, and very informative. I am thinking of
course of what had been turned out in the past, namely by me,
following the given standards of the time.

We have some new World Archaeologists coming up for their
degree. I will look them over, and give you the names of the
best of the lot.

With best wishes,

Sincerely,

Stefan Szlęzak, Prof.

622 Ohio Street
Lawrence, Kansas 66044

October 18, 1979

RECEIVED

Bernard W. Poirier, Director
Iroquois Research Institute
Suite 414
3251 Old Lee Highway

Fairfax, Virginia 22030

OCT 24 1979

THE ARCTIC COMPANY, LTD.

[U.S. ECONOMIC INSTITUTE]

Dear Mr. Poirier:

I have completed my review of the draft of the report titled "Inventory and Evaluation of Archaeological Resources of Clinton Lake, Kansas and Mitigation of Potentially Eligible Sites." All in all I find it an adequate workman-like report, which should satisfy the Corps of Engineers requirements. As with many other reports of this type, I feel that it is unfortunate that some could not have been done by way of a contribution to our understanding of the local prehistory, not to mention the potential contribution which a study of this type could make to anthropological knowledge.

Following are a number of specific suggestions for the improvement of the report:

- 1) p. 9, para. 2, l. 3. Bison did not appear before well into the Holocene. They have not been found with Paleo-Indian remains.
- 2) p. 9, para. 2, l. 5. What is evidence for Opuntia as important food source in Plains?
- 3) p. 10, para. 3, l. 2. What is evidence for Bison importance in tall-grass prairies?
- 4) p. 12, l. 1. In fact the environment of the Plains is considerably more varied.
- 5) p. 12, para. 1, l. 2. How did the headwaters of the Missouri get to Colorado?
- 6) p. 12, para. 2, l. 2. This definition of the NW Plains is incorrect. See Wedel.
- 7) p. 13, para. 1, l. 3. Recent evidence makes it doubtful Plains abandoned because of aridity. See Prison for NW Plains, and Schmitz (Coffey site) for Central Plains.
- 8) p. 13, para. 1, l. 5, 6, 7. What eastern forest innovations, and what is evidence for acculturation?
- 9) p. 13, para. 1, l. 8. This harks back to the days of Wissler and Krueber. The horse, at best, intensified long-standing (and spectacular) patterns.
- 10) p. 13, para. 2, l. 3. What is evidence for a cold tundra in the Plains?
- 11) p. 15, para. 2, l. 5. Actually squash and gourds (tropical cultigena) were being grown in east by ca. 2000 B.C. Perhaps corn as well if pollen data from Koester is correct.
- 12) p. 15, para. 3, l. 2. Evidence for pit houses in Plains Woodland sites?

Dr. Johnson's comments are valid criticisms of factual shortcomings apparent in the original Clinton draft. These shortcomings were especially noted in the background sections and in the summary. These sections have been completely rewritten in the final report in order to make them more accurate and relevant to Central Plains archaeology.

13) p. 16, para. 2, l. 3. While I see what the author is saying, this does not provide a ready image of a Central Plains tradition earthlodge. This is not the house type known for Plains Woodland.

14) p. 17, para. 2, l. 8. Renner is in Missouri. There are other Kansas City Hopewell sites not obviously derived from Archaic (in Kansas).

15) p. 48 and following. Chert discussion should use Reid's work:

Reid, K.C.
1977. Nebo Hill. MS, Missouri State Highway Commission,
Jefferson City, Missouri.

1979. The KCIA Chipped-stone Artifacts as Indicators of Prehistoric Raw Material Procurement Patterns. In, Cultural Resources of Kansas City International Airport and Its Environs: Preliminary Reconnaissance, compiled by Brad Logan, pp. 97-120. MS, Kansas City International Airport, Kansas City, Missouri.

16) p. 59, para. 1, l. 9. Pottery can be tempered with many things, but not vacuoles. Something has eroded away leaving the holes.

17) p. 59, para. 1, l. 16. Previous investigations have turned up only one obsidian flake in a Kansas City Hopewell site. The material is not of uncommon occurrence in Great Bend variant sites in Central Kansas

18) p. 74, para. 2, next to last line. Edgewood point dated to A.D. 1. Some point in Plate 10 dated to 2500-850 B.C.

19) p. 249, para. 3, l. 2. Gibson points occur in sites other than Hopewell.

20) p. 249, para. 3, l. 3. A single obsidian flake is hardly evidence of Hopewell Interaction Sphere. Most of evidence suggests Hopewell communities in W. Missouri and E. Kansas were outside the Interaction Sphere.

21) p. 250, para. 2, l. 3. Scallorn points are Woodland diagnostics, pre-Central Plains tradition.

22) p. 250, para. 2, l. 6. Comment same as above.

23) p. 250, para. 3, l. 1. Plains Woodland and Central Plains sherds can be distinguished.

24) p. 250, para. 3, l. 5. Vacuole tempered.

25) p. 251, para. 1, l. 162. Sherds cannot be analogous to a ware. Some Pawnee pottery is not clay tempered (this is probably Brog rather than clay, anyway). What is the Central Plains Period?

26) p. 251, para. 1, l. 4. The statement simple utilitarian pottery without durable elaboration is meaningless without a comparison to some standard.

27) p. 251, para. 4. I fail to see the significance of the comparison with the Cuete phase.

28) p. 257, para. 2, l. 5. Considering the amount of tree growth in the valley bottoms, I fail to see how scouting them from above could be very effective.

Bernard M. Pointier
October 18, 1979
Page Three

29) P. 257, para. 4, L. 3. What is evidence that pottery not taken on long trips?

30) P. 258, para. 2, L. 7. Why does an isolated bison bone indicate presence of buried archaeological sites?

31) P. 285, para. 2, L. 3. Wave not wake.

32) The line drawings of chipped stone artifacts are not adequate representations. See the following publication for excellent examples of how this technique should be used:

Bordes, Francois
1961. Typologie du Paléolithique, Ancien et Moyen. Publications de l'Institut de Préhistoire de l'Université de Bordeaux.
Bordeaux, Mémoire No. 1. Bordeaux.

I hope these comments will be of assistance. My time in reviewing the draft amounts to 10 hours.

Sincerely yours,



Alfred E. Johnson

Kansas State Historical Society
120 West Tenin • Topeka, Kansas 66612 • 913-296-3251

December 5, 1979

Donald L. Fritts, Assistant Chief
Engineering Division
Attn. MRED-BR
U.S. Army Corps of Engineers
Kansas City District
700 Federal Building
Kansas City, Missouri 64106

Dear Mr. Fritts:

Staff review of the draft report entitled "Inventory and Evaluation of Archeological Resources of Clinton Lake, Kansas and Mitigation of Potentially Eligible Sites" by Iroquois Research Institute has been completed. This report does not satisfy all of the requirements outlined in the scope-of-work for the project. In general, the staff found the document to be more concerned with form than with content. Many statements made as fact were not referenced and appeared to represent the opinion of one of the report's authors. Some statements were misleading, such as the definition given on page 306 of a focus - "Similar to and at times interchangeable with phase. The term focus usually has more of a geographical orientation than phase (see Phase)." The definition of a focus specifically excludes any reference to geography or the geographical distribution of archeological artifacts or sites. The terms focus and phase are two hierarchical classification levels in the Midwest Taxonomic System; while an alternate classification scheme uses the term phase to combine the concepts of space and time. The terms focus and phase are mutually exclusive ways of viewing archaeological artifacts and sites and they are not interchangeable. The failure to adequately research, document and interpret the archeological terms "focus" and "phase" is one example of the superficial nature of the report's content; that is repeated in its other sections. The obvious lack of expertise demonstrated throughout the report severely restricts its value both to the profession and the general public and makes its conclusions and recommendations suspect. Listed below are specific comments that follow the outline of the report found in the Table of Contents on page vii.

Comments concerning the Smithsonian trinomials, cemented sandstone hammerstones, and protohistoric Native American occupation in the general study area are also addressed in the final report.

These comments were reviewed and discussed on 19 February 1980, during a conference in Topeka, Kansas, including Iroquois Research Institute, the Kansas State Historical Society, and the Corps of Engineers. When the agreements reached between Iroquois Research Institute and the Corps of Engineers during pre-negotiation to the Clinton Project were explained to the Kansas State Historical Society, the Society indicated that many of their critical comments involving the scope of analysis, survey, and testing undertaken by Iroquois Research Institute were no longer relevant.

The Kansas State Historical Society also commented extensively upon factual shortcomings evidenced in the draft report. In response to these concerns the environmental section in the final report has been extensively revised, and the archaeological background section is completely rewritten. The summary is also rewritten as a result of comments from the KSHS concerning factual and theoretical shortcomings of the original report.

As a result of questions concerning artifact classifications employed in the original report, a section has been added to the final report explaining the categories utilized in the classification. Chert heat treatment is also discussed in the final report.

Clarifications concerning the treatment and analysis of soil samples recovered from testing operations are included in the final report.

KSHS comments concerning the Smithsonian trinomials, cemented sandstone hammerstones, and protohistoric Native American occupation in the general study area are also addressed in the final report.

Orval A

Introduction

An explanation should be given for the statement on page 2 that the Wakarusa River Valley is located near the eastern limit of the Tall Grass Prairie. Authorities in the physical sciences, such as Victor E. Shelford, have noted this boundary to be as far east as western Indiana.

It was stated on page 12 that "...the three major streams around which aboriginal life was focused in Kansas were the Missouri...the Republican-Kansas River...and the Arkansas River in the south-central portion of the state." That implies Kansas' aboriginal inhabitants chose those rivers named over other major streams. In fact both major and minor streams were utilized.

The description of the Central Plains given on page 12, including Kansas, Nebraska, and western Missouri, is not commonly used; in addition this description does not agree with that given in the Glossary on page 301 which expanded the definition of the Central Plains to include eastern Colorado and the western half of Iowa.

The statement made on page 13 regarding the introduction of the horse into the plains requires documentation.

This section of the report sketching the prehistory of the Plains Culture Region in general and that of eastern Kansas specifically was disoriented because of the use of general and nonregional sources. The use of authors such as Jennings, Frison, Caldwell, Strouder and others slanted the perspective offered for each major cultural/historical period. The description of the Paleo-Indian period was based on data from areas west of the Plains region, the Early Ceramic (Woodland) period was described using information from areas east of the Plains region and the Middle Ceramic, termed Central Plains Complex in the report, was slanted toward the Northern Plains. The capsule summaries might be appropriate for these other areas or regions, but they did not present the background needed for an interpretation of the archaeology of Clinton lake.

The exclusive use of the Oklahoma Anthropological Society's series on projectile point typology biased some of the cultural and temporal identifications made of sites at Clinton lake. Those publications name and describe a large number of point types; however, the majority of these types were identified from sites found in the Southern Plains and some types were named from artifacts represented only in surface collections.

The summary of the final report has been rewritten as a result of KSHS comments concerning interpretation of the archaeological record, ethnographic analogy, site function, and chert availability. In the report, the term "exposure" refers to the cardinal direction in which a prehistoric site is least protected by surrounding topography. (See comment 6 on page 8 of the KSHS review).

Justifications for National Register recommendations are revised in the final report in order to correct several of the inconsistencies noted by the KSHS reviewers. Recommendations for secondary testing at sites 14D0155, 14SH101, 14SH103, and 14SH104 reflect the fact that only limited testing of newly discovered sites was authorized by the contract.

The Glossary has been extensively revised. Except in several isolated instances, however, individual entries are not referenced. The purpose of the glossary is seen as an aid for the non-technical reader of the report. In this context, individual citations for glossary entries are considered to be inappropriate.

The recovery of a Clovis point base during survey at a site in Clinton lake, while significant, was not uncommon for the area. The statement made in the report that this find is "one of a few" such finds was not accurate. Points associated with the Paleo-Indian period have been found throughout the state. Like the Clinton lake artifact these all been surface finds, except for that from the 12 Mile Creek site. The association of these surface finds with subsurface features or archeological deposits would, however, be a rare occurrence. The 12 Mile Creek site in Logan county should be mentioned in the discussion of the Paleo-Indian period on page 14.

The paragraph describing house plans on page 16 was out of context. No Plains Woodland, Kansas City Hopewell or Cuesta Phase house plan resembles those described, and the arrangement of a central fireplace with four main posts was not the prototype plan or pattern for other house plans as claimed.

A reference should be given for use of the Tercus Central Plains complex or Plains Village tradition. Certain sites from this time period are affiliated with the Central Plains tradition as determined by their cultural content. These sites are not found in eastern Kansas, except for those few Nebraska phase sites located in a limited geographic area adjacent to the Missouri river trench in the extreme northeastern corner of the state. Neither the Pomona focus nor the locally defined Clinton phase is affiliated with the Central Plains tradition although they share some traits such as Globular pottery vessels and small triangular side-notched points, among others; however, no earth lodges are found in sites of either the Pomona focus or those of the Clinton phase.

The description of the proto-historic and historic periods in the Central Plains given on page 21 was incomplete; for instance, no mention was made of the Plains Apache in the west. The statement that the Kansa were first encountered by the French in 1673 implied contact with that group, when in fact only information of their existence was recorded on a map at that time. The Kansa village site mentioned as being located near Atchison was actually the Doniphan site in Doniphan county, a property listed on the National Register of Historic Places. A chronology should be supplied for the Kansa village locations mentioned on page 21. The paragraph as written implied these sites were inhabited simultaneously. A description of the immigrant tribes and the locations of their reservations in eastern Kansas should be included in this section.

Disposition of Background Data

The Kansas State Historic Preservation Officer is incorrectly identified.

Methodology

The discussion of the survey methodology stated the survey area was divided into ecological zones and the sites were ranked according to size, but apparently no attempt was made to correlate site size with ecological zone. The efficiency of the method used for the survey cannot be determined, but at least two recorded sites in the Upland Prairie zone, 14D0130 and 14D0140, are smaller in size than the transect interval for that zone. Additional sites of that size were presumably missed in the survey.

In addition to site size an additional factor of site visibility should have been considered. Except for the Hooded Slopes zone, cultivation of greater or lesser amounts of land in the other zones could be expected in the survey area and this would facilitate or inhibit site survey in them.

The testing methods chosen appeared to be arbitrarily selected and not related to the nature of the sites under investigation, or directly related to the goals of the project to obtain information about each site's function or periods of occupation.

No rationale was given for selecting a 1 x 1 meter test pit size. In fact, the statement made on page 36 that two or three crew members were assigned to the excavation of each test pit would seem to indicate a larger size would be needed for maximum efficiency. In a similar vein digging a 1 x 1 meter test to a depth of 184 cm such as was done at site 14D0144, while not impossible, seems inefficient and the reason for restricting the size of such a deep test not apparent from the report.

The placement of test pits in each site seemed to be done in an equally mechanistic fashion. The testing program recognized differences among the sites to be tested, but this was limited to size "...a one hectare site was allocated half as many test pits as a two hectare site." (page 35) and importance "...a proportion of the budgeted field effort was reserved for additional excavation at sites which were thought to be especially important." (page 35). Tests apparently were always placed in areas of "...a site which had high concentrations of surface artifacts, in ...the expectation that such areas had a higher probability for containing subsurface features and artifact concentrations." However, no reason for this assumption was given. Staff experience has shown that quite often sites that have few surface indications are those with intact subsurface features and artifact concentrations since they have not been disturbed and brought to the surface.

This testing approach seemed to be based on the assumption that except for size, all sites in the survey area had the same characteristics, that a 1 x 1 meter test in one site would produce

The same results as a 1 x 1 meter test in another, and that a 1 x 1 meter test was sufficient to recover information and discover permanent features, such as piles and hearths, that would enable the archaeologist to determine the site's function and locate material suitable for determining the date of the site's occupation, all of which is required in the research design.

The depth of some tests was apparently determined in an equally arbitrary manner since shovel tests were dug to a depth of 30 cm (page 38), in spite of the fact that some previously tested sites had materials located below that depth.

Although site size and importance were stated to be factors in determining the amount of testing done at each site, a review of the descriptions of tested sites showed this was not always the rule. Site 14DQ137, at which the base of a Clovis-like point was found during survey, is potentially an important site as the report noted in four places (pages 16, 26, 246, 282), and it has been suggested for nomination to the National Register of Historic Places on that basis. The site was estimated to be 100 meters x 300 meters in size and it was sampled with seven (7) 1 x 1 meter test pits. No additional culturally diagnostic artifacts were found (page 129). Although undisturbed cultural deposits were said to exist below the plow zone,

In contrast Site 14DQ140 which was interpreted to be a quarry site, 50 meters x 75 meters in size, also received seven (7) 1 x 1 meter test pits. No culturally diagnostic artifacts or permanent features were found, but a large amount of "quarry waste" was noted (page 135). In a similar vein Site 14DQ148 which measured 30 meters x 150 meters, had six (6) tests as did Site 14DQ309, which measured 85 meters x 130 meters; no diagnostic artifacts or permanent features were found at either site.

None of these three sites was judged to be important prior to testing, yet as much or more effort was expended on them as at Site 14DQ137 which was recognized to be potentially unique and important since its initial recording.

The methods used for analyzing artifacts recovered from the sites were inadequate. The superficial and careless methodology employed in analysis was illustrated in the composition of Table 5, entitled "Lithic Artifact Code Sheet" (page 46). The code sheet, according to the report, was to be used in conjunction with the glossary (page 144). Included among the lithic artifacts were "modeled clay" categories of rim and body sherds. The category

J-6 "notched flake" was not defined in the Glossary, while the definition of a "flake tool" as "Any tool fashioned from a flake which does not morphologically resemble a defined artifact type." (page 30b) required the reader to supply the necessary criteria in order to define this artifact and is no definition at all.

Listed under Cores was category 074 "Quarry waste" which was defined in the Glossary as "The remains of materials extracted from a quarry, usually debitage and chunks of stone not suitable for further processing." Debitage (part of the definition above) is defined in the Glossary as "Lithic debris produced in tool manufacture." The class Debitage in Table 5 contained five separate categories, including category 083 "Retouched flake" which the Glossary defined as "A flake exhibiting regular, intentional retouch on any of its margins." It thus appears that under the methodology used, one artifact might be classified as either a "retouched flake" or as "debitage" or as a "core" or as all three.

The use of codes to describe the relatively small number of artifacts recovered from the project seemed inappropriate. These codes were not always adequately defined, as noted above, and their use coupled with the absence of any descriptive measurements for the artifacts only served to obscure the data rather than to clarify it or make it useful for comparative purposes.

The discussion of cherts in this section was inadequate. The stratigraphic succession in the Clinton lake area was not identified, nor were the individual cherts associated with each stratum. No information was given regarding the locations of any outcrops or sources of chert in the project area other than that associated with site 149104, and no geological identification was provided for this location. This section of the report fails to meet the requirements of section 3(h)(2) of the scope of work. Given this background research the statement made on page 49 that "no artifacts found in the Clinton survey probably came from a nearby source" seemed optimistic. Statements made later in the report describing the "ancient" character of some cherts appear unsupported by any evidence there or in the sections.

The reviewer noted that "pared" is not a word as stated on page 50 and in Table 7. "Chert Classification Table" however,

The section comparing chert sources and color made no mention of thermal alteration of the cherts. The possibility that color change in the rock might be associated with this process has been noted by several researchers. In this light, the statement made on page 472 that "signs of thermal effects to have been heat treated" has no context.

The final paragraph in this section (page 54) described the treatment of soil sample taken in the project, but no analysis of the material was included in the record.

Description of Surveyed Sites

The original site number system described on page 189 was developed by the Smithsonian Institution, not the Kansas State Historical Society. It was adopted by the Kansas Archaeology Commission as a standard for work carried out in the state.

The description of hammerstones made of sandstone noted on page 231, should be expanded since artifacts of that material have not been previously recognized in an archaeological context within the state.

The association of prehistoric sites 14SH103, 14SH104 and 14SH105 with a historic "1857 Indian Trail" should be further analyzed and explained. Topics to be covered should include the trail and the historic Kansas occupation, the circulation of the area by the immigrant tribes and the source and destination as well as the products traded along the Wakarusa river.

Summary of Prehistoric Resources

The discussion of artifact types and site functions noted on page 257 did not discuss the variable factors that can affect a collection and its interpretation. Some of these factors are artifacts removed from the site by previous collectors, the changing visibility of the surface indications of a site at different seasons and under different conditions (see the description of site 14Sh102 for an example) or the efficiency of different recovery techniques, as for example, surface collecting vs. subsurface testing.

The discussion of site function on page 257 seemed restricted in scope. The interpretation of artifacts recovered from these sites was limited to speculation about their production as a result of processes involved in using lithic technology. The possibility that some of these repair "stations" resulted from some activity other than hunting was not explored.

In a similar vein the supposition that some of these sites may represent butchering places should be more fully explained in the absence of butchered animal bone.

The reference cited, the use of unmodified flakes as butchering tools was a report on the experimental use of obsidian flakes for this task. This material has vastly different properties from the chert flakes found in the Clinton area and some comment about this difference would seem appropriate.

The repeated interpretation of many of these sites as hunting "overlooks" or hunting "stations" should be documented by ethnographic references. The reference cited for activities carried on at these places refers to observations made of Eskimos hunters at a hunting station during a visit to Barrow, Alaska. There may be certain common traits shared among all hunters at all times, such as some knowledge of animal behavior, but animal behavior would also influence hunting methods. It is not clear how the use of an overlook or hunting station would correlate with the behavior of animals known from archaeological evidence to be important to prehistoric people at Clinton lake.

The statement made on page 252 "hearer injury is friable and easily broken. It was not carried it is a gash this should be documented."

The abundance of chert outcrops noted on page 253 was not documented.

One important upland prairie plant resource documented in ethnographic literature but not mentioned in the discussion of resources in the ecological zones is Juniperus scopulorum.

The characterization of site locations made on page 26 that sites have "an open or southern exposure" was confusing. No rock shelters were located and none of the sites found had man-made walls or other means of regulating a site's "exposure" to any direction. Site exposure needs to be defined.

Recommendations

The recommendations made for National Register listing seemed incomplete. In view of the limited amount of testing done at most sites and the uncertain place many of the sites occupy in the interpretation of the prehistory of the lake, it would seem that additional sites should be included for potential National Register listing. In particular, designating site 14003 as a site "representative" of the upland component, while at the same time citing its potential Paleo-Indian component seemed inconsistent. This recommendation apparently was based on the assumption that the function of these sites in the settlement patterns evident in the valley had been adequately documented and that these sites were homogeneous to a degree that a "representative" site could be named. The reviewers disagree with this assumption for reasons cited earlier in the critique.

The scholars who are currently investigating research topics in the Clinton lake area, as noted on page 280, and their research topics should be identified.

The recommended testing program for sites found during the 1979 survey was not fully justified. It appears this testing should have been accomplished under section 3(b)(b) of Appendix A of the scope-of-work. The criterion that a site must have a quantity of surface artifacts to be considered to be "important" is questionable. Field experience in eastern Kansas has shown that sometimes sites having only minimal surface indications can have undisturbed subsurface features and dry sites.

The relationship of these sites to others located in the valley was not explained very well and statements of significance such as that made for site 15sn103 that it could be a "...source of data for study of settlement systems and resource use in the project area" seems too general. The statement of significance for site 15sn104 that it "...may provide important information needed to understand prehistoric resource utilization at different locations in the Kawarau Valley" should be amplified, since it is not clear how excavation here will also provide information about prehistoric resource utilization at other locations. It should be possible to define more clearly the relationship and significance of these sites given the previous archaeological work that has been done in the Kawarau river valley.

No comment was offered in this section regarding National Register eligibility for any of the historic sites found in the survey. This should be corrected.

The description of adverse effects and their mitigation as explained in this section was not adequate. A cultural resource management plan should include all resources located on project lands. This section should be revised to satisfy the requirements of section 106 of the scope-of-work.

Glossary

Most of the terms given in the glossary have been previously defined, e.g., settlement patterns, Mac-America, Central Plains Area. All terms should be researched and authorities cited. When terms used in the report differ from those accepted by professional archeologists, for instance, "Cultural Horizon A soil horizon which has been culturally altered," (page 303) these should be noted and a reason given for using the version that deviates from accepted usage.

Very truly yours,

Joseph W. Stell
Joseph W. Stell
State Historic Preservation Officer

United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
INTERAGENCY ARCHAEOLOGICAL SERVICES CENTER
P.O. BOX 24700, DENVER, COLORADO 80224-0700



RECEIVED

12/6/79

RECEIVED

DEC 4 1979

THE ARCTIC COMPANY LTD
IROQUOIS RESEARCH INSTITUTE

Mr. Donald L. Fritts
Assistant Chief, Engineering Division
Department of the Army
Kansas City District
Corp. of Engineers
750 Federal Building
Kansas City, Missouri 64196

Dear Mr. Fritts,

In response to your request of October 11, 1979, we have reviewed the report entitled "Inventory and Evaluation of Archeological Resources of Clinton Lakes, Kansas, and Mitigation of Functionally Eligible Sites." This draft report was prepared by the Iroquois Research Institute under your Contract No. DACT-11-8-C-002. Enclosed please find copies of the individual reviews.

As you will note, the reviewers are not persuaded of the creditability of this study. The report authors appear to have difficulty in responding to the requirements of the scope of work. Specifically, the presented research design is professionally inadequate and insufficient as management tool. The erratic application of National Register criteria for evaluating resources remains unexplained. The reviewers also questioned certain aspects of methodology, field techniques, terminology, data presentation, and knowledge of regional archaeology, presented in the report. Without resolution of these questions, it is difficult to comment on the evaluations and recommendations of this study.

We are impressed with the handsome format and organization of the report. Unfortunately, the contents are less handsome in terms of professional achievement.

Sincerely,

Jack W. Rudy
Chief, Interagency
Archaeological Services - Denver

UNITED STATES GOVERNMENT
memorandum

Date: October 30, 1979

Subject: Review of "Inventory and Evaluation of Archaeological Resources of Clinton Lake, Kansas, and Mitigation of Potentially Eligible Sites" by Iroquois Research Institute for the Kansas City Corps of Engineers

To: Supervisory Archaeologist Hoffmann

The Clinton Lake Survey-of-Work is an ambitious document which requires intensive archaeological survey, testing and utilization of the impact to specific sites within the project area. The specific sites to receive mitigatory attention were specified by Chambers et al. (1977). The b. 591 areas of previously unsurveyed lands to be intensively surveyed were designated by Change Order No. 1, dated July 25, 1978. And those sites identified were to receive sufficient attention to determine their limits and historical significance. The project's study approach for all phases of the investigation required data recovery for the study of lithic technology, for a human ecological study of prehistoric trans-harance activities, or the research of prehistoric settlement patterns, and for an examination of population demographics within the reservoir area.

The Clinton Lake report is well written, well edited, and displays excellent graphics. I commend Iroquois Research Institute (IRI) on their inclusion of a management summary in this report. A management summary is an efficient way of providing information for cultural resource managers that minimizes or eliminates unnecessary searching through pages of technical jargon. This management summary, however, is unfortunately brief. This section should include all the pertinent information required for planners to make enlightened decisions. This entails the purpose of the report, the study objectives, the constraints on the investigation, the study results, and finally, the management recommendations.

Unfortunately, the Clinton Lake report is only a "black glossy;" upon first glance it appears extremely well done, but upon closer examination, it reveals severe weaknesses that are professionally inexcusable. Harrington (1973) indicates that the archaeological process involves three basic stages: data recovery, data evaluation, and the interpretation of these data. The last stage has been, until recently, shortchanged in archaeological investigations. Interpretation contributes immediate inferences which may lead to broad generalization. An ultimate goal of all anthropological archaeology should be to anthropologically define or further elucidate human behavior patterns and cultural processes. IRI, by requirements of the scope-of-work, was responsible for all three of these stages of research but has managed to only partially complete the first and second steps.

The management summary has been included within the general introduction, and this section has been expanded to include the information lacking in the original management summary.

The document cited in support of the reviewer's opinion (Harrington 1979) is not a federal regulation and is consequently irrelevant to the acceptance of a cultural resource management report. The reviewer is stating his anthropological opinion, not reviewing the acceptability of a management document.

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan Optional Form No. 10
U.S. GOVERNMENT
DEPARTMENT OF THE TREASURY
BUREAU OF THE PUBLIC DEBT

problems begin with even the title of this report. The SOW 4b(1) requires that "the main text of the report . . . be written in a manner suitable for reading by persons not specifically trained as archaeologists." The title suggests that in addition to an inventory and evaluation of the resources, there will also be "mitigation of potentially eligible sites." What does this mean to the layman? Potentially eligible for what? What does this mean to the professional? To the professional, it suggests that IHR does not understand the relevant historic preservation procedures. Only those sites which are eligible for nomination or are already nominated to the National Register of Historic Places require mitigation. Be it avowed, in situ preservation, or mitigation through data recovery. The inclusion of the word "potentially" in the title belies the author's knowledge of the law.

The Charlton Lake report is a very disappointing document. The potential value of such an archaeological investigation has not been realized. This project had the possibility to add so much to our understanding of this area's prehistory, yet it was concentrated only on another "grocery list" of artifacts and sites. Work of this kind was acceptable during the 1910- and 1920s but is unacceptable for today's archaeology. The Charlton Lake project area was well within the loosely defined limits of this Sow of Work. An archaeologist's laboratory for studying the past lifeways of the prehistoric and early historic peoples of this reservoir area. This does not simply mean the identification of these people by their "diagnostic" artifacts or their placement in temporal or spatial classification systems: an approach which focuses upon artifacts, their type and their variation. The Sow indicates that the Corps of Engineers wanted ore for their money. The basic orientation of this investigation was to . . . provide an important resource base for the study of behavior patterns relating to seasonality and scheduling of subsistence activities, patterns of settlement and movement within the drainage system, population demographics, and lithic technology." Section 3 of the Sow also indicates that ". . . the upland sites also offer the opportunity for examining the systematic interrelationships of resource availability, selection, and exploitation in this biophysiological zone."

This indicates the importance of studying biological populations, not artifact types. The artifacts are important as indicators of past behaviors. The question to be asked focuses not upon the "type" but rather upon the function of a particular artifact or assemblage of artifacts.

The cultural groups examined did interact with their physical and biological environment. The primary goal to be attained is to explain the differences and similarities of human behavior patterns by formulating and testing explicitly stated hypotheses. The engineers should deal less with simple minded description and more with the analytical techniques required for hypothesis testing. Of critical importance is the collection of

The title of the report has been changed to reflect more accurately the purpose and scope of the study.

Section 3.b.(7) and 3.b.(8) of the scope of work specifically limited the level of artifact analysis to a preliminary study aimed at identifying and curating all recovered materials, and the cataloging of diagnostic and representative tool types.

quantitative data, statistical analysis, and numerical models (cf., Raab 1976).

The research design presented by IRI (p. 30-34) is grossly inadequate. The authors employ terms such as "scientific," "significance," and "analysis" to give the appearance of legitimate contemporary cultural resource investigations. This section offers a defense of substantive theoretical or methodological contributions to the discipline. This research design is a reiteration of the SOW which is ultimately a restatement of the author's 1977 "work" in the area. As for their discussion of significance, the authors apparently do not understand the authority they cite (Jellicoe 1971). Under this criteria of true significance, all archaeological sites are significant. The single most important criterion for determining significance of archaeological sites lies in the ability of the resources to answer problem-oriented research questions (Raab and Fligner 1977; Schiffer and House 1975; Schiffer and Gumerman 1977:219 and 290).

A researcher must establish his objectives and carefully state his criteria for evaluating significance. He must then examine the fit between his data and the criteria he has selected. Fundamental to this scientific approach is the formation of an innovative and creative research design. Every research design is to some degree different because each is a logical ordering of priorities and, by definition, requires flexibility. As a process, both additive and cumulative, the accumulation of new data is reflected in the on-going evolution of the research design.

The elements of a research design are a measure of the researcher's orientation, assumptions, strategy, organization, methods and technique. As such, the research design offers a means by which to determine significance. The research design fits research activities to its goals. It provides a mechanism whereby research may be directed and evaluated. When questions of significance arise, the research design provides a guide by which decisions may be made and assessed (cf., Raab and Klinger 1977).

Because the National Register criteria for significance are so broad, another approach to the problem has been adopted by Sharrock and Grayson (1979). Their attitude focuses upon placing the responsibility for proving that a site is not significant upon the shoulders of the archaeologist. An archaeological site is considered significant until it is proven otherwise.

In either case, IRI has not fulfilled the requirements of the SOW in terms of National Register evaluations. The research design offered here reveals little of the detail necessary to evaluate its methodological sophistication or its feasibility. Despite the need for a tractable framework, McGimsey and Davis (1977:72-73) offer the following essential elements of a research design:

→

The entire discussion of research design presented in this review is supported by the citation of many academic and theoretical articles. None of these works (Raab 1976; Raab and Klinger 1977; Schiffer and House 1975; Schiffer and Gumerman 1977; Sharrock and Grayson 1979; McGimsey and Davis 1977) are federal regulations guiding the conduct and evaluation of cultural resource studies.

I. The basic archaeological and anthropological perspective governing research formulations.

A. Purpose and reasons for the research

B. Underlying assumptions

C. Theoretical organization

D. Methodological base of the approach.

II. The environmental, archaeological and relevant prehistoric context of the project area:

A. Period of occupation

B. Cultural affiliation

C. Relationship and significance of the project area and environmental and cultural regions of which it is a part

D. If there are serious deficiencies in the knowledge of the area relative to these concerns, these should be identified

III. Research goals and their rationale

A. Hypotheses to be tested

B. Test implications (and analytical methods)

C. Reasons for selection of research goals

IV. Research strategy, schedule, and priority

A. Identification of environmental situations and categories of cultural data to be sampled

B. Identification of the resources to be studied

C. Reasons for the selection of variables to be sampled

D. Sample size and sampling procedure (either the selection of sites or for data recovery within a particular site)

E. Project implementation techniques and their relevance to the aims and purposes of the study

F. Data recovery techniques to be used

G. Analysis procedures to be used

H. Plans for the dissemination of the research results

Given this expectation and framework, ZRI's research design reflects a paucity of information. In the research design section the mentions significance recovered above and beyond four pages justifying an iradecrease coverage of the survey area. The justification is unacceptable as Charge Order No. 11, dated July 25, 1948, indicates that an "intensive survey" was to be completed with "thoroughly spaced at intervals greater than 50 m apart, 100% coverage is impossible. In addition, 50 m may be the closest interval between crew members. Per Floodplain, Upland, Prairie, and Glaciated Survey Report, walked at intervals of 60m, 100m, and 120m respectively. These distances are simply too great for a complete coverage of the Survey Area as per the Survey requirements. ZRI continues with a rather cursory discussion of site testing, survey, and laboratory methods to be employed (10 pages of narrative and 10 pages of tables).

SCIENTIFIC REQUIREMENTS

P. 31 - Para 3 - Please indicate short terms. By my definition, the project ended as nearer the western limit of the Tall Grass Prairie than the eastern limit of the area.

P. 32 - This section requires more references. Or is this inference the result of independent research on the part of IR?

P. 32-34 - The computerics provided to justify such large intervals between crew members requires some sort of control to test them. How many sites did IR miss in the course of this survey?

P. 36 - How did the "action hoe" overcome the lumping and balling of clay on the screen? Why would it be any easier to cut the clay with an "action hoe" than with a sharp sharpened shovel? I question the author's claim that the toe edge could "cut through clay to a maximum depth of one centimeter." Personal observations and use of this implement do not bear this out. Did IR dispense with screening? If so, this is unacceptable. Waterscreening would have overcome the problems cited. If one is to study lithic technology, as is indicated by the SOH, the retrieval of micro remains is mandatory for competent study. Were any soil samples retained from these excavates? If so, this should be stated as well as the recovery techniques employed and the data expected to be recovered.

P. 38 - "A rake test . . . was used exclusively on steep wooded slopes." Am I to assume that ground visibility was obscured in all other areas surveyed?

P. 39, para 2 - Requires a figure indicating the location of these 43 cutbank inspections. Profiles would also be encouraged and should include basic soil descriptions for each profile.

P. 48-50 - This discussion of local chest colors ignores the effects of heat treating on the color of chart samples.

The survey transect intervals employed in the Clinton Lake Project were agreed to by the Corps of Engineers prior to fieldwork.

The environmental background section in the final report has been revised and is thoroughly reference.

The discussion of site testing methodology is clarified on page 37 of the final report.

This sentence is misleading and has been rewritten in the final report.

The location of the cutbank survey is indicated on the baseline maps submitted with the background data. No field profiles were drawn. Individual examinations were not mapped.

In the final report, the problem of chert heat treatment is addressed on page 55.

P. 54 - How large were these samples? Were they retained from each square?

After each 10 cm level?

Each soil sample consisted of a 2 gallon sample. Soil samples were retained from each 10cm level of each test pit.

P. 59, line 9 - "vacuole tempered" Plains hooded ceramics are characterized by grit, gray, and sometimes sand temper. The Keith focus is evinced by calcite temper. I do not understand the term vacuole as it is applied here.

All tables illustrating test pit stratigraphy should reflect basic Munsell soil color descriptions.

The statistics cited at the bottom of page 60 can be questioned because as noted above, the methodology section is unclear.

Where are the basic site maps which indicate the location of subsurface test pits?

P. 73, para. 1, line 1 - What was the pH reading to support the author's statement concerning the acidity of the soil?

What is the difference between flakes, interior flakes, and debitage?

The glossary is no help

P. 92, top - The methodology section did not mention flotation. What else did it not mention?

The following test pits indicated that cultural material was still being found in the lowest level of each of these pits but excavators quit digging. Why?

TABLE	TEST PIT	TABLE	TEST PIT
11	A,B	25	C
15	A,E,F,I,J,K,N	27	A,C,E,F
17	A,B	29	B
21	B,C	31	A,G,H
23	D	33	A,B,D,F
			41
			B,D,E
			43
			B,D,E
			45
			C

What is a site for the purpose of this survey? The authors never clearly define this term. For example, are two flakes or one pot shard considered a site or an isolated find? These terms must be operationally defined somewhere in the report. The definition offered in the glossary is fine for laymen but requires greater elaboration for those who are to use or evaluate this report.

The report lacks an indepth study of lithic technology. It lacks any coherent statements regarding behavior patterns relating to seasonality and scheduling of subsistence activities." It also lacks expected information and interpretation of settlement patterns and population movements

The reviewer's exception to the term "vacuole tempered" is well taken. This expression is removed from the final report.

The stratigraphic summary tables included with each site description are intended as convenience tables, not as test pit profiles. As such, soil color or texture notations are inappropriate.

The statistics apply to artifacts actually collected and cataloged. The possibility that small items may have been overlooked in the excavation or screening process does not affect the validity of these figures.

Test pits were excavated in part to determine site size. Specific test pit locations were noted only with respect to site 14DO144, which was intended for the inundation study. This information is contained in the background data.

This statement is based upon information presented in the Soil Survey of Douglas County, Kansas (U.S. Department of Agriculture 1977).

The artifact classification methodology employed is detailed on pages 47-51 of the final report. Classificatory terms are defined in this section.

The term "flotomatic" was misspelled in the draft report. The passage refers to water screening.

See page 37, 4th complete paragraph of the final report.

See page 42, 2nd paragraph of the final report.

Detailed artifact analysis required for the study of lithic technology was not required or requested by the scope of work (see reply (4)).

within the drainage system. Furthermore, it looks very scholarly examining of the "systemic interrelationships between resource availability, scientific, and exploitation by prehistoric populations." These were all requirements of the SOW.

The authors recommend four sites (points 155, 156, 153 and 154) for initial testing to determine whether or not they meet the criteria for inclusion in the National Register of Historic Places. This recommendation requires an evaluation under Criteria No. 1, dated July 25, 1976 which requires an evaluation of both historical testing to determine the nature of the site and a vertical orientation, new site, and to rate significance distinctions (points No. 16 and 17). Furthermore, these recommendations reflect the shortcomings of IRI's research design in recommending further work for "the biggest and best sites. The determination that sites 153, 157, 153 and 154 are significant and should be considered eligible for nomination to the National Register of Historic Places also reflects this approach to the resources.

I question the validity of this entire investigation and feel that IRI has provided ample fuel to the anti-archeological fire that burns as a result of disastrous archeology being conducted in this country today.

REFERENCES CITED

- Charles, Mary Elizabeth et al
1977 The cultural resources of Clinton L. ne, Kansas: an inventory of architecture, history and architecture. Iroquois Research Institute, Fairfax, Virginia
- Harrington, J.C.
1979 The importance of interpretation in historical archaeology. North American Archaeology 1(1):75-84
- Mc Gumsey, Charles R., III and Hester A. Davis
1977 The Arlie House Report. A Special publication for the Society of American Archaeology
- Ranab, L. Mark
1976 Pine Mountain: a study of prehistoric human ecology in the Arkansas Ozarks. Arkansas Archeological Survey, Research Report No. 7, Fayetteville
- Ranab, L. Mark and Timothy C. Klinger
1977 A critique appraisal of "significance" in contract archeology. American Antiquity 42(4):623-634
- Schiffer, Michael B. and George J. Gumerman
1977 Conservation Archaeology. Academic Press, New York

- Schiffner, Michael B. and John H. House
1975 The Cache River archeological project: Arkansas Archaeological
Survey Research Series No. B Fayetteville
- Sharrach, Floyd W. and Dennis F. Dawson
1979 "Prehistoric" Connecticut deer antler. American Antiquity
45:327-328.

UNITED STATES GOVERNMENT
memorandum

Date November 6, 1979

OBJECT Review, "Inventory and Evaluation of Archaeological Resources of Clinton Lake, Kansas and Mitigation of Potentially Eligible Sites."

TO by Interim Research Institute, Study Director: Bernard W. Poirier

Supervisory Archaeologist (Institute): *gpt*

Scope of Work

U.S. Army Project

Clinton Lake Project in Douglas County (northeastern) Kansas 22,250 acres with 7,500 acres to be inundated - testing and/or excavating specified sites

1 - Test 18 sites to provide cultural data on resource base for the study of behavioral patterns relating to seasonality and scheduling of subsistence activities, settlement, movement, population densities, lithic technology, etc.

- a) collect data for studies of above
- b) perform ecological, botanical, and zoological studies when applicable

- c) photograph field work
- d) record and collect
- e) collect for C-14 dating
- f) curate materials
- g) preliminary analysis of materials
- h) use metric system

- i) coordinate site references for MPS inundation study

The main text of the report shall be written for persons not trained as archaeologists.

Sand Change

Incentive survey of 20 additional sites for prehistoric, including paleontological sites

Bury U.S. Army's Burial Registry on the Payroll Savings Plan
Garrison Command
Army Corps of Engineers
Fort Riley

4) Limited testing on few sites to determine limits and nature; historic eligibility.

5) Service & Management Plan

Comments:

The sections of the Master Site Report are highly commendable, even though they are longer than I have done. In particular, Kinnane's section on the objectives and the process of the work. These aspects of the report deserve greater attention to detail and the desire of the professional archaeologist to understand what the standards and methods of the site were. However, I believe he could have been bolder in his conclusions regarding standards.

The report is extremely technical, efficient and almost entirely clear. It has been assembled to relate and to reveal fully both the author's background in the field and his ability to be written in a clear, straight forward manner. The descriptions of the typological analysis is excellent. As to the analysis of the artifacts, it would be of great interest to the reader to know more about the types of artifacts analyzed. Although it is important to have good well written descriptions of artifacts that can be used for identification and comparison, it is even more important to have descriptive terms for defining them. A narrative section, in my opinion, preceding a technical section, would be better.

There are comments about certain surfaces in writing style which I find redundant. There are many more improvements in this regard, but they are minor, but they are important, but they are important to the style.

Page 2 - Direct observation of the ground surface was the primary method of detection in areas where burial surface was disturbed, such as in a plowed field. The above sentence is an example of over-writing.

Page 2 - "Bullerde, Palaeoliths and Williams projectile points are unique to the non-artificial first. I am an experienced archaeologist and I have never heard of these types." This is a personal preference. Throughout the text the word "judgmentally placed" (in reference to test pits) is used frequently. Why not simply: "test pits were dug in what seemed to be appropriate locations," or "Five test pits were dug at the blank site."

This is a personal preference. Throughout the text the word "historic" is used to denote artifacts and sites that are truly "historic" as well as perfectly modern artifacts such as a 1954 Chevrolet and a New-Age Cassidy. In other words, this is a corruption of the meaning of the word "historic." The use of the term "judgmental" to describe the placement of test pits has been largely eliminated from the final report.

The use of the term "judgmental" to describe the placement of test pits is nevertheless important to offer documentation of the recent age of an historic site.

A don't exactly know exactly what I'm doing & would be drawn to be erratic
or erratic kind of writing, however, at least one of these things would
be discussed in a more detailed fashion.

Final Line 2 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

Final Line 3 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

Final Line 4 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

Final Line 5 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

Final Line 6 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

Final Line 7 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

Final Line 8 - Beginning the sentence

As indicated in the last line, we were examining artifacts & things that
had been collected in the field. We had collected artifacts from a
number of different areas, as well as some artifacts from the same area.
As such, it was necessary to keep track of where these artifacts came from.

This error has been corrected in the final report.

The chain link gauge, for example, is a chipped stone artifact.
These items were in any event described by Scherzer originally
at Luray's Research Institute.

In the final report, terms such as "floodplain" or "selected terrace"
are capitalized when used to name the specific coastal flood zones
recognized in the study area. Otherwise, they are not capitalized.
American Antiquity style was not specifically requested by the editor
of this work. The use of *Ibid* is perfectly valid.

Prior to the 1976 Triassic Research Institute survey in the Clinch
reservoir area, previous work had concentrated on the adjacent areas
of the floodplain and rear, the dam. Many of the sites discovered
in 1976 and subsequently recommended for testing in 1977 were situated
outside of the floodplain in higher elevations. It is this
situation that is referred to in this passage.

The transect intervals used in this study were selected by the
cooperative archaeologists and by several other government agencies in
the United States.

See the discussion on Pages 39-44 in the final report in a clarifying
fashion in the Survey methodology.

AD-A148 690

SURVEY AND TESTING OF ARCHEOLOGICAL RESOURCES AT
CLINTON LAKE KANSAS 1978-1979(U) IROQUOIS RESEARCH INST
FAIRFAX VA M NATHAN AUG 80 DACHW41-78-C-0054

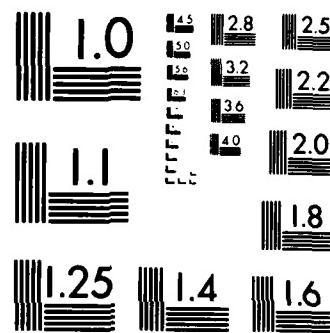
4/4

UNCLASSIFIED

F/G 5/6

NL

END
TAPED
DTR



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

P. 34 - Transect Interval

Exactly what is meant by transect interval. I would define it as the distance between transects. How is it used in this report-- the distance between field party members in a transect or is it the width of the transect. Explain please.

P. 39, para 2 - cut-bank inspection

How was this done? Were fresh cuts made by the crew or were the banks merely observed in their natural condition. If the latter was done then I can understand why no sites were encountered. Fresh cuts are required to find artifacts/features/sites.

Results

P. 59, line 9 - What is vacuole tempered pottery? This is a term from biology: how does it apply here?

P. 59, line 10 - Bob is informal, use Robert instead

P. 164, para 1, line 10 - "functional use" This phrase is redundant. Simply say "...'s function" or "its intended use" or "its intended purpose".

P. 250, P. & 2 - ceramic sherd is redundant By definition sherd are ceramics.

Each transect is defined as a 1 meter wide path walked by each surveyor. The transect interval is the interval between each 1 meter wide transect.

The draft report clearly indicates that a profile was trowelled to expose the stratigraphy. This discussion remains in the final report.

The expression "vacuole tempered" has been removed from the final report.

The use of "Bob" is avoided in the final report.

The expression "functional use" is deleted from the final report.

The expression "ceramic sherd" has been removed from the final report.

unpublished

Review of "Inventory B...Evaluation of Archaeological Resources of Clinton Lake, Kansas, and Mitigation of Potentially Eligible Sites" by Brooks et al of Iroquois Institute

SUGAR-REFINED MUSCLE OXYGEN

from serious consideration. Nevertheless, certain comments are made that may be addressed. With respect to the objections to the title, the title of the final report has been changed to more accurately reflect the scope of the investigations undertaken in Clinton Lake. It should be noted, however, that the Government's own scope of work for this project referred to the proposed undertaking as "mitigation."

As I vividly recall, I found the 1977 Clinton survey by Iroquois to be one of the most unprofessional products I had ever seen. Although pre-judiced toward Iroquois work, I tried to review this document with an open mind - maybe they got some new personnel or learned something from our (and others') comments. I was wrong.

To begin with, the title (how much more of a beginning can you have?) and pages 4 to 6 reflect the authors' ignorance of the cultural resource laws. We do not mitigate potentially eligible sites - we only mitigate eligible sites. If a site has the potential to yield important information (36CFR60.6(d)), then it is eligible. Sites are tested to determine if they do or do not meet the criteria for eligibility: yield or not yield.

Sufficient information should have been derived from the testing of the sites to make conclusive evaluations. Documentation must be provided for all sites investigated as to why certain ones are eligible and why others

p. 10 - The criteria are applied to all sites - not just those "... Judged potentially significant. ..." Moreover, in order to mitigate, the sites must first be determined eligible or listed on the National Register of Historic Places and then the comments of the Advisory Council on Historic Preservation must be sought per 36CFR800. Sites are not mitigated unless they meet the Register criteria and the ACHP has commented - there is no

The authors do not know their local projectile points: page 89, Plate 11 (D); try Synder's page 109, Plate 13 (b); is more likely a Sedan point as McKee is a Northern Plains type; page 190, Plate 26 (N) Beant is another northern Plains point; page 174, Plate 23 (w) is probably a Langtry - not Langtry-like. There is far too much of this " - like" point identification. This indicates that the authors do not know the local archaeology. Bell is old and out of date and there are much better discussions on both sides of the literature than the area.

In response to the comments of this reviewer, as well as others, the identification of artifacts has been revised throughout the final report to reflect more accurately local Kansas typologies.

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

The changes to the contract (better than the SOW) calls for a research design. There is no research design in the report. I recall that the Iroquois survey was going to tell us all about Ponoma (and blew it badly) but here, Iroquois doesn't do anything.

p. 43 - The use of 20 x 20 meter grid unit is much too large to gain any useful information other than some extremely gross distributions. A unit this size barely qualifies as being a controlled collection. Moreover, we are never told the rationale for using the 20 x 20 m units. Nor are we told why "rake tests" or "shovel tests" were used to "... supplement the data gathered." Supplement what kind of data? Supplement for what reason? Their field techniques amount to an attempt to achieve a systematic grab sample. Note the contradictions implied with the underlined words.

Table 9 and 10 are okay, I guess, but how about raw material by each artifact? Where are the basic data described including metrics for all materials found? All we are provided with are a few drawings of some "diagnostics." This was the problem with the Iroquois survey report, too.

I've gone far enough in this report to see that the rest will be similar. The major criticism is that the authors simply do not know the local literature. Having Iroquois completely re-do the survey and testing would be of no help to the Corps. Whereas the Corps may accept this report (as they did with the survey report after our objections), they could find themselves in a precarious legal position. I surely would not want Iroquois to do the mitigation for the reservoir, but then there are so many problems stemming from their previous survey work that I suspect very few individuals would want to touch this now.

Because of what I have seen in this work and as it is based on their previous work, were I the Corps, I would not believe in anything presented here - especially any evaluations and recommendations.

It was agreed during the January 23, 1978 pre-negotiation for this project that the quote in the scope of work, together with a statement of the survey methodology sufficed as a research design for the Clinton Lake project.

This comment results partially from a misunderstanding of the methods used in site investigation. This discussion has been clarified on pages 42-44 of the final report.

Detailed artifact analysis, including metric data for all recovered artifacts, was not required by the scope of work for this project.

The admitted bias of this reviewer casts a cloud over his feeble attempt for scientific objectivity.

APPENDIX C

INUNDATION STUDY

The protection of cultural resources is an increasing Federal concern. The Reservoir Inundation Studies Project currently being conducted by the National Park Service has three primary aims: 1) to assess what impacts upon archaeological sites can be predicted when those sites are inundated by reservoir projects, 2) to determine which archaeological data classes can be expected to survive inundation, and 3) to discover alternatives to salvage excavation which can be taken to mitigate adverse impacts upon the cultural resources subjected to reservoir inundation. The study at Clinton Lake was designed to correspond with the Reservoir Inundation Studies Project and provide comparative data for studies carried out at sites in other reservoirs.

Site 14D0144 has several characteristics which may make it suitable for analysis of the short- and long-term effects of fresh-water inundation on archaeological sites. First, there are cultural materials in the surface soil horizon and in a subsurface horizon which is overlain by culturally sterile soil horizons. Thus, there would be an opportunity at this location to study the effects of inundation on the surface distribution of cultural materials as well as on in situ cultural materials below the surface. In addition, the bison bone recovered from the site indicates that some organic remains may have been preserved. This site may therefore present an opportunity to study the effects of an inundation environment on floral and faunal remains.

Other characteristics of the site which may make it suitable for inclusion in the inundation studies are its setting in the lake relative to the shoreline, the variable depth of water which will cover the site, and the possibility for either erosion or sedimentation or both on portions of the site. At the normal multipurpose pool level of the lake, the site will be covered with about 15 feet of water and will be suitable for examination by shallow water diving techniques. The shallowness of inundation and the range in elevation of the site from 262 to 265 meters (860 to 870 feet) above sea level also mean that some portions of the site will be exposed about once every three years while the lowest level of the site will be exposed about once every 15 years. Portions of the site will therefore lie periodically in the shoreline zone of the lake and will be subject to shoreline erosion.

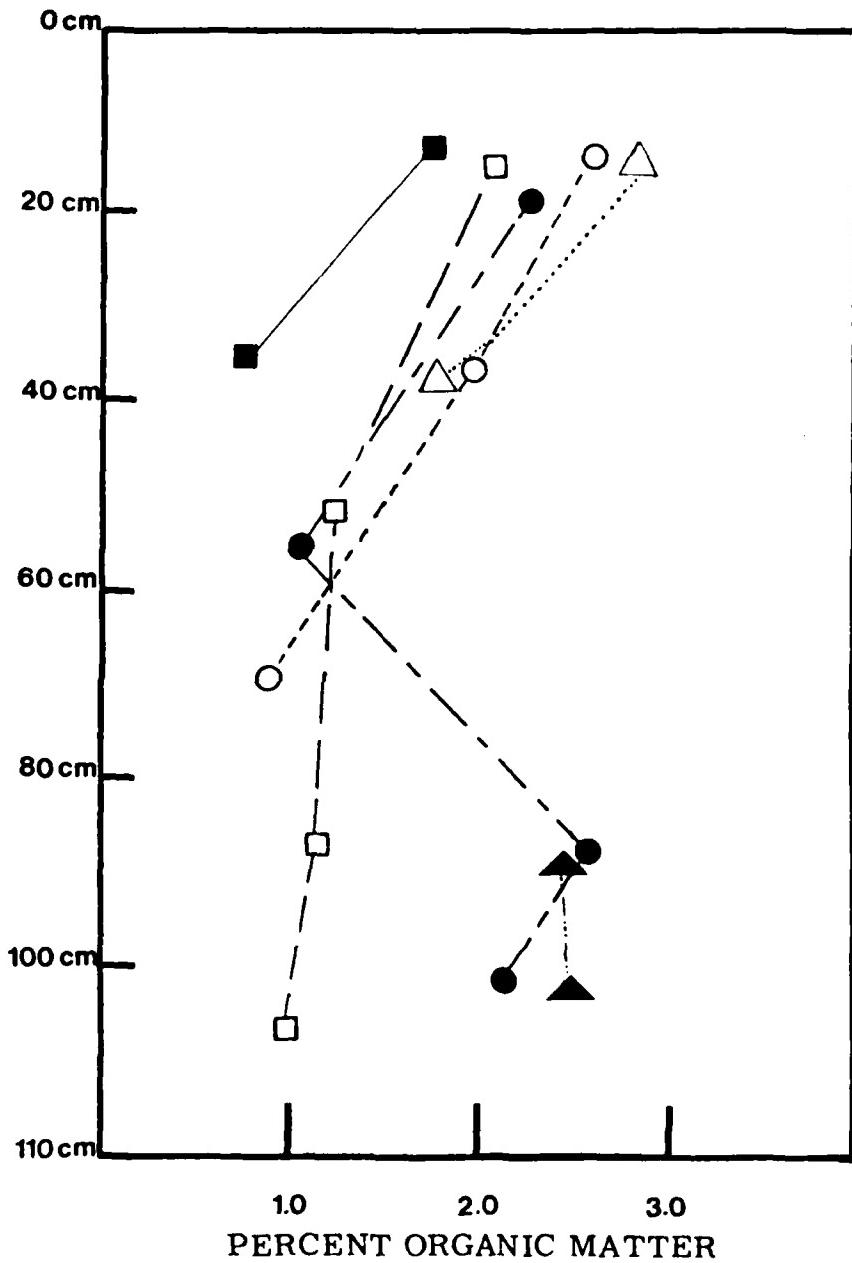
In addition to the cultural remains buried by sterile soil layers, there is also a buried paleosol within portions of the site. The presence of the paleosol is apparent both from visual inspection of the soil profiles in test pits and from examination of the organic matter content of the different soil horizons. The percent of organic matter from several levels in the test pits is shown graphically in Figure 4. Test pit D is approximately normal for many deep, fine-textured soils in this area, but two of the test pits, A and B, have abnormally high organic matter contents at depths between 90 and 105 centimeters. This indicates that the former soil surface is now covered by at least 80 centimeters of sediment.

The presence of paleosol horizons and the relative absence of soil profile development above these soils indicate a rapid alluvial deposition over parts of the site within the recent past. The youth of the floodplain deposits in this location is also indicated by the rather uneven surface of the floodplain. Alluviation can be quite uneven in such settings when large trees slow the

FIGURE 4

DISTRIBUTION AND DEPTH OF ORGANIC MATTER IN TEST PITS AT 14DO144

DEPTH BELOW SURFACE



LEGEND

- - TEST PIT A □ - TEST PIT D
- ▲ - TEST PIT B ■ - TEST PIT E
- - TEST PIT C △ - TEST PIT G



water current and intermittent drainages from the nearby upland slopes produce channeling of the alluvium or crossbedding of the deposits. It is thus not surprising that the paleosol horizons over the site are of uneven vertical and horizontal extent.

The 0-2% slope over parts of the site also indicates that slopewash during the historic period may have moved small artifacts within the plow layer for considerable horizontal distances. Also, if the area contained small depressions when it was first cleared during the historic period, gradual cut and fill leveling of the site under cultivation could have buried prehistoric artifacts which were on or near these depressions at the beginning of the historic period. Such artifacts may now be covered by up to a half meter of culturally sterile soil which has eroded from the adjacent slopes.

Seven archaeological test pits were excavated at the site. Each test pit was excavated with 10 centimeter arbitrary units below the plowzone. Cultural materials were obtained from one or more levels in each test pit, the maximum depth of recovery being 174 centimeters, in test pit A. Test pits A and C contained prehistoric cultural materials below the plowzone but none in the plowzone, an indicator that some sediment deposition has occurred subsequent to prehistoric use of the site. The maximum extent of the continuously culturally sterile layer was 90 centimeters, in test pit C. In test pits B and D, prehistoric cultural materials were confined to the plowzone. In tests E, F and G, artifacts were found to depths of 30, 20 and 50 centimeters respectively.

Soil samples were obtained from various levels of five test pits for chemical analyses. These analyses, including the determination of organic matter content, were performed by the Soil Testing Laboratory of the Department of Agronomy at Kansas State University according to the procedures contained in the regional recommendations for agricultural soils testing (North Central Region Soil Testing Committee 1975).

The results of these tests are shown in Table 67. Except for variations in the amount of organic matter already discussed, none of the soil chemical values are unusual or unexpected. These data are included here and in the background data for this site as a set of baseline observations against which to measure possible effects of inundation.

Two permanent inundation markers for marking the site and assisting in its location for future study were installed. Marker 1 was placed on the southern periphery of the site while Marker 2 was placed on the northern periphery. Plate 33 is a photograph of Marker 2. Each marker consists of a piece of steel pipe encased in a larger polyvinyl chloride plastic pipe held in place by a poured concrete base. The steel pipe was also filled with concrete to add mass and exclude water and air from the interior. The steel was used for strength and as a marker which could be remotely detected with magnetometric instruments. The plastic was used for its durability in the underwater environment which will exist at the site for the lifetime of the Clinton Lake project.

TABLE 67
CHEMICAL ANALYSES OF SOIL SAMPLES FROM ARCHAEOLOGICAL SITE 14D0144,
CLINTON LAKE, DOUGLAS COUNTY, KANSAS

ARCHAEOLOGICAL PROVENIENCE OF SAMPLE	pH	ORGANIC MATTER %	EXCHANGEABLE POTASSIUM- PPM	AVAILABLE PHOSPHOROUS- PPM	AVAILABLE CALCIUM- PPM	AVAILABLE MAGNESIUM- PPM	AVAILABLE NITROGEN- PPM
Pit A 0-35 cm South Wall	6.5	2.3	232	100+	3,361	336	13.6
Pit A 35-75 cm South Wall	6.8	1.0	250+	22	3,632	416	5.7
Pit A 75-90 cm South Wall	6.7	2.7	238	40	5,594	532	6.7
Pit A 95-110 cm South Wall	6.3	2.2	250+	40	4,385	444	11.6
Pit B 75-90 cm South Wall	6.5	2.6	250+	54	3,442	399	3.9
Pit B 95-110 cm South Wall	6.6	2.5	250+	55	3,650	403	5.7
Pit C 0-24 cm West Wall	7.7	2.5	250+	60	4,945	205	6.2
Pit C 24-48 cm West Wall	7.8	1.8	250+	100+	4,315	271	3.2
Pit C 48-88 cm West Wall	7.5	0.8	250+	48	3,656	388	3.9
Pit C 50-75 cm South Wall	6.3	1.1	200	100+	3,269	487	7.0
Pit D 0-31 cm North Wall	7.4	2.1	250+	100+	3,733	179	17.1
Pit D 31-71 cm North Wall	7.1	1.2	218	80	3,343	400	10.1
Pit D 71-100 cm North Wall	7.0	1.1	250+	32	3,358	423	4.7
Pit D 100-110 cm North Wall	7.0	1.0	250+	16	3,428	406	7.8
Pit E 0-25 cm East Wall	6.8	1.8	250+	100+	3,631	349	2.8
Pit E 25-45 cm East Wall	7.0	0.8	225	27	2,921	367	6.8
Pit G 0-25 cm South Wall	7.4	3.0	250+	75	3,868	209	11.5
Pit G 25-60 cm South Wall	7.2	1.5	250+	3	4,259	528	6.3



PLATE 33

Inundation Marker No. 2. This view of Inundation Marker No. 2 for site 14D0144 shows the above ground portion of the plastic pipe assembly. The two black rings nearest the top of the pipe are for positive identification of the marker in case one of the markers is destroyed or the external markings do not survive long-term inundation. The blade of the tape measure in the photograph is extended exactly one meter.

Figure 5 shows a cross section of Marker 2. Attention is called to the plastic rings which are around the pipe and on the cap of Marker 2 but not on Marker 1. These were added to assist divers in differentiating between the two markers by touch under low visibility conditions. Also, in the event that the surface markings disappear or one of the markers is destroyed, the site can still be easily located.

CROSS SECTION OF INUNDATION MARKER INSTALLATION

14D0144

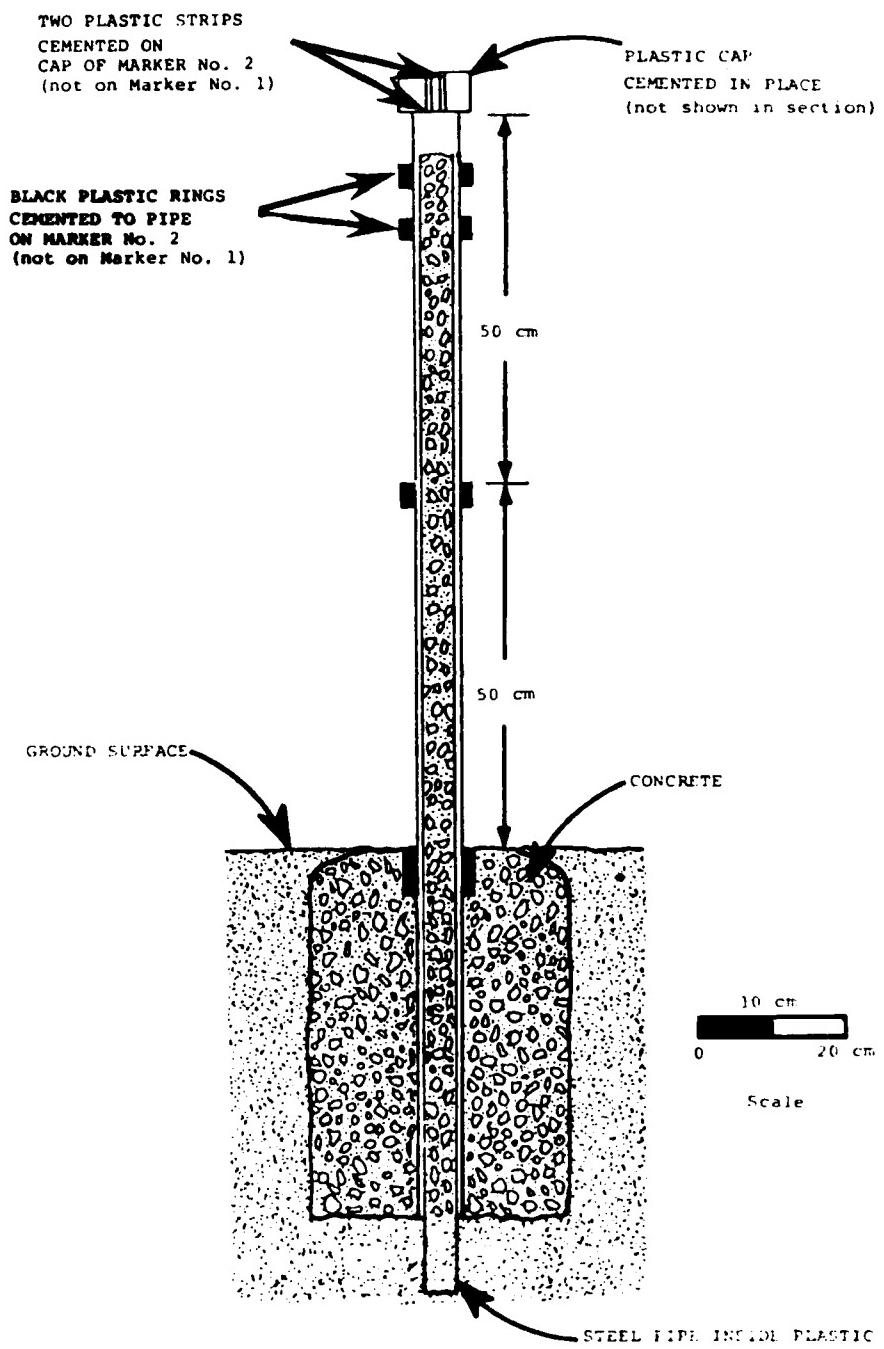


FIGURE 5

Each marker was referenced to a permanent C.O.E. sedimentation marker that is located above the maximum flood pool level at an elevation of 278 meters

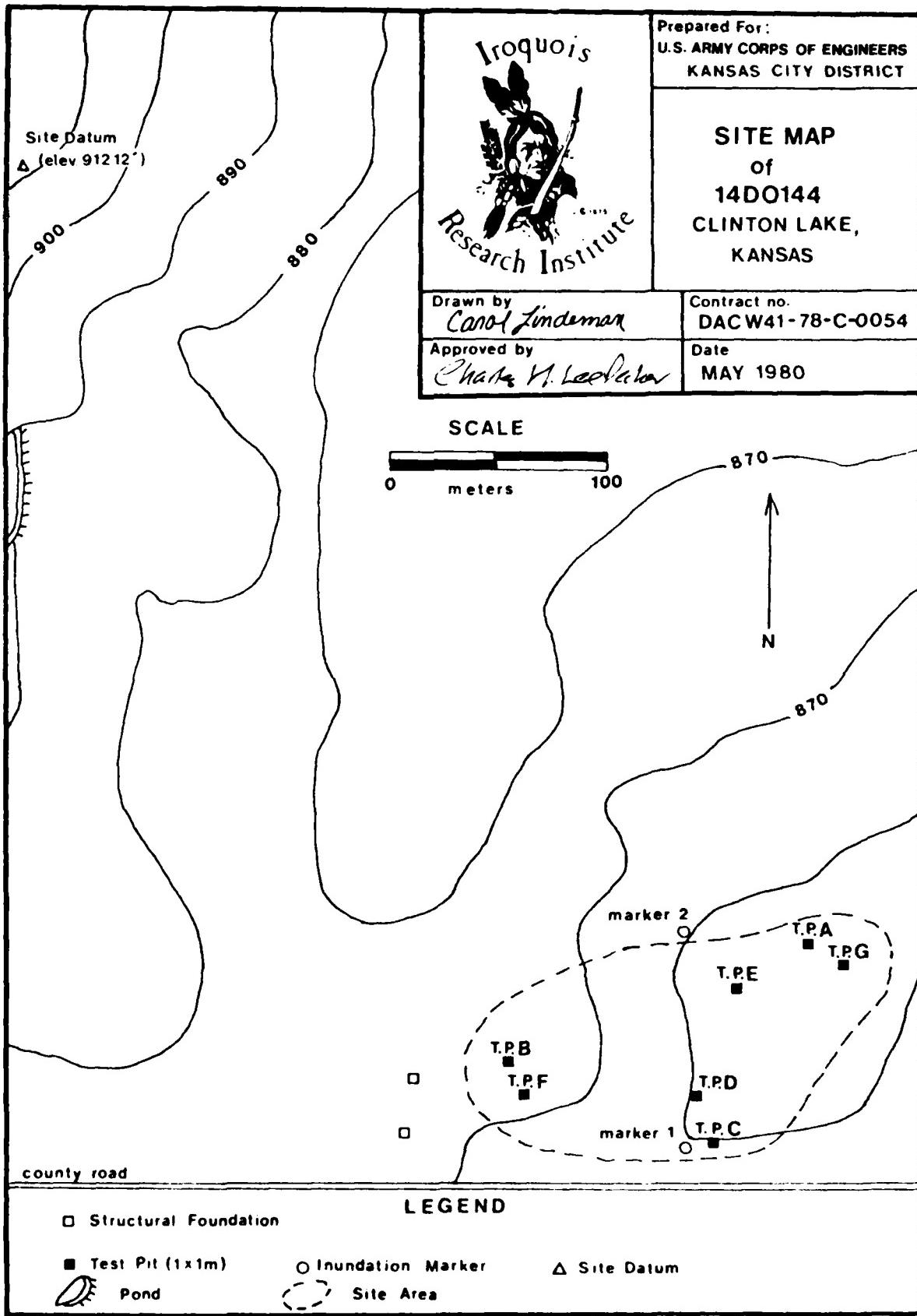
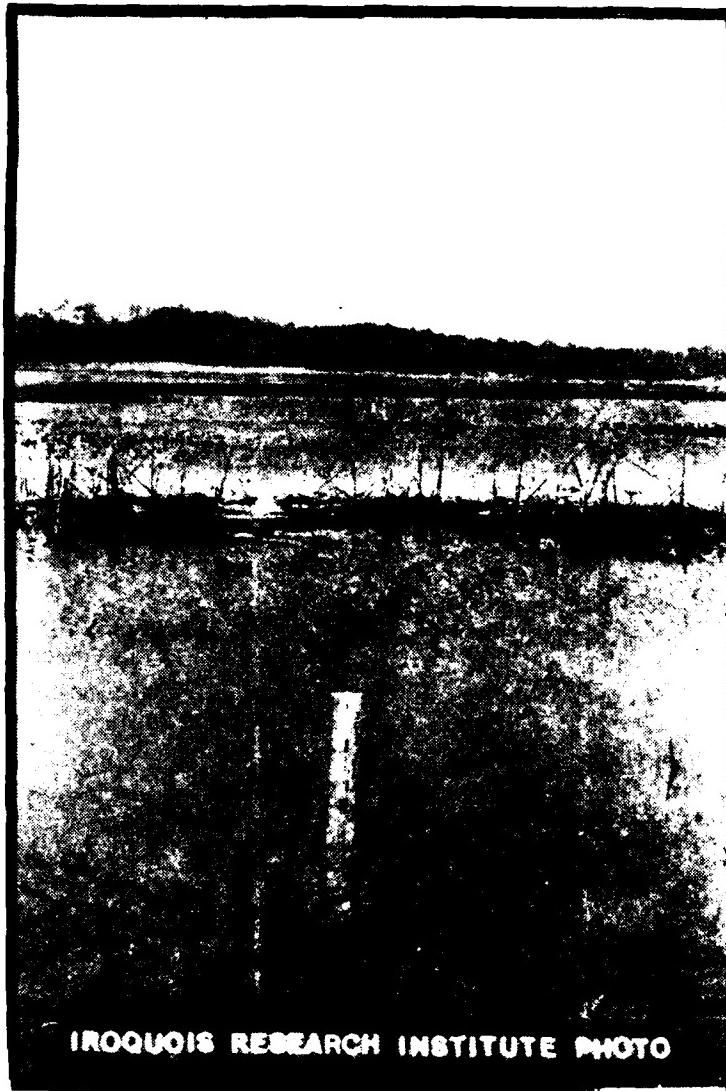


PLATE 34



IROQUOIS RESEARCH INSTITUTE PHOTO

PLATE 35

Initial Inundation of Site 44. This photograph, taken in April 1959, shows the initial inundation of site 44. Marker No. 15 in the foreground while Marker No. 2, located to the north, is in the center of the photograph. When the tailing storage for Clinton Lake is completed, this site will be about 10 feet of water, approximately even with the base of the wooded slope in the background.

(912 feet). Plate 34 is a topographic map of the site which indicates the locations of the inundation markers, the permanent datum, and the excavated test pits. Excavation records and soil profiles are included in the background data. A photographic record has been maintained which documents the excavation of the test pits, the installation of the markers, and the initial inundation of the site, shown in Plate 35.

One of the objectives of the inundation study is to add to the data base so that in the future cultural resource managers may more accurately assess the impact of fresh-water inundation on archaeological sites. Once the impacts of inundation can be accurately predicted, innovations in mitigation plans may be possible. Traditionally, excavation has been viewed as the primary mitigative measure for sites to be inundated. Although no definitive alternatives have yet been established, a number of possibilities are being investigated in various locations throughout the United States. These include protective covers and sealants placed within the site to protect its integrity, erosion and sediment deflectors to prevent soil deposition, and the use of chemical preservatives. As this study effort grows and the data base strengthens, the design of more sophisticated means for protection of cultural resources will be possible.

ABOUT THE AUTHORS AND CONTRIBUTORS

Iroquois Research Institute is one of the most active private research centers for archaeological and historical investigations in North America. The firm is headquartered in Fairfax, Virginia, outside Washington, D.C., and maintains branch offices in Memphis, Tennessee; New Orleans, Louisiana; and Los Angeles, California. The Institute has attracted a highly skilled staff organized in the research services of Anthropology, History, Architecture, and Environment and Engineering. In addition to the full time staff, visiting scholars are invited to participate in specialized and complex research projects.

Charles H. LeeDecker

Technical Director, Archaeology
Principal Investigator

M.A., 1978, Anthropology, George Washington University
B.A., 1970, Anthropology, Cornell University

Mr. LeeDecker has been Principal Investigator for over 10 large CRM projects in Kansas, Missouri and Arkansas involving Plains, Ozarks and Mississippi Valley prehistoric cultures. He is accredited by the Society of Professional Archaeologists with certification in field research and cultural resource management projects. His principal areas of archaeological expertise include survey design, complex site taxonomies, and computer coding and data processing management. As Technical Director for Archaeology, Mr. LeeDecker supervises archaeological activities for the Institute. He has developed several CRM plans and directed numerous archaeological projects at all levels of complexity in the field and in the laboratory.

W. Mark McCallum

Archaeologist
Deputy Field Director

B.S., 1978, Sociology and Anthropology, James Madison University

Mr. McCallum has over three years of archaeological field experience which includes supervision of numerous excavations and survey level projects in Arkansas, Kansas, Missouri and Virginia. He served as assistant Field Director for the Clinton Lake, Kansas project in 1978 and 1979. Mr. McCallum has written or participated in the writing of CRM reports. He has also served as laboratory supervisor for the Institute and has experience in flotation analysis and lithic and ceramic analysis.

Wesley R. Stinson

Archaeologist
Field Director

M.A.c., 1979, Anthropology, University of Connecticut
B.A., 1973, Psychology, Clark State University

Mr. Stinson had two years of prior experience in archaeological projects in Connecticut, New Jersey and the Aleutian Islands before joining Iroquois. In addition he has participated in several reconnaissance and intensive survey projects in Arkansas, Missouri and Kansas. He was the Field Director for the 1979 survey at Clinton Lake. Mr. Stinson has conducted lithic analysis on New England and Alaskan artifacts and is the author of several technical papers.

Cecil R. Brooks

Senior Environmental Scientist

Ph.D., 1963, Plant and Soil Sciences, Texas A & M University
M.S., 1961, Agronomy, Virginia Polytechnic Institute
B.S., 1958, Agronomy, Virginia Polytechnic Institute

Dr. Brooks has 19 years of research experience including five years of environmental impact analysis for diverse engineering projects, natural resources development, and recreational facilities. He has been a contributing author and researcher for various Iroquois studies, including a research design for a predictive model of cultural resources in the St. Francis Basin in Missouri and Arkansas, and has published numerous professional papers. His present interests include paleoecology in relation to prehistoric land uses.

John D. Hartley

Assistant to the Technical Director, Archaeology

A.B.D., 1980, Anthropology, Tulane University
M.A., 1974, Anthropology, University of Oklahoma
B.A., 1971, Anthropology, University of Oklahoma

Mr. Hartley has been involved in cultural resource management projects since 1971, working his way up from laboratory assistant and crew member to crew chief, and then to field director and project archaeologist. His archaeological experience is in Kansas, Missouri, Oklahoma, Louisiana and Central America. His skills include historical and archival research and lithic and ceramic analysis.

Paul V. Heinrich

Geologist and Geomorphologist

M.S.c., 1980, Geology, University of Illinois
B.S., 1976, Geology, Louisiana State University

Mr. Heinrich has participated in projects concerning the Quaternary geology of Illinois and the archaeological geology of sites in Louisiana, Texas, Arkansas, Missouri, Panama and the Outer Continental Shelf. His primary research interests are in Quaternary geology and the application of geology to problems in archaeology.

The following personnel contributed to the compilation and storage of data and to various stages in the production of the report.

Carol E. Lindeman

Graphic Artist and Cartographer

B.F.A., 1975, Sculpture, Boston University

Ms. Lindeman is responsible for the production of graphs, maps, illustrations and other visuals for publication. She has experience as a freelance artist and has designed and illustrated historic preservation publications and promotional materials.

James W. Mueller

Chief of Service, Anthropology

Ph.D., 1972, Anthropology, University of Arizona
M.A., 1971, Anthropology, University of Arizona
A.B., 1963, Liberal Arts, Rutgers University

Dr. Mueller has published a number of professional papers and participated as a co-author of and researcher for numerous Iroquois projects including the St. Francis research design project. His major present interest is sampling methodology and its applications.

Teresa E. Ossim

Archaeologist

B.S., 1978, Communication Arts, James Madison University

Ms. Ossim is an experienced archaeologist at the reconnaissance, intensive survey, testing and excavation levels for prehistoric and historic sites. She has served as crew chief and project director for cultural resource

investigations in Arkansas and Missouri. Her additional CRM experience has been in Kansas, Virginia and Louisiana. Ms. Ossim has assisted in the compilation of the supplemental texts containing the cultural resource background data.

Jeffrey Quilter

Senior Archaeologist

A.B.D., 1979, Anthropology, University of California, Santa Barbara
M.A., 1975, Anthropology, University of California, Santa Barbara
B.A., 1972, Social Science, University of Chicago

Mr. Quilter has participated in archaeological field work in New York, New Mexico, California, Missouri, England and Peru. His interests include the origins of complex societies in the Americas, the inference of social organization through mortuary studies, and the relationship between cultural resource management and academic archaeological studies.

Geralyn Truszkowski

Cartographer and Graphics Illustrator

M.F.A., 1980, Design, George Washington University
B.F.A., 1973, Design, Michigan State University

Ms. Truszkowski is an experienced graphic artist and illustrator and supervises the production of graphics, charts, art diagrams and line work for the Institute's environmental and cultural resource reports. She has taught drawing, painting, design, and advanced studies in the arts, and has considerable experience as a freelance graphic artist and illustrator. In addition, her work is exhibited in art shows throughout the United States.

Kaytee L. Umbreit

Graphics Illustrator

B.F.A., 1975, Painting, Kutztown State College

Ms. Umbreit has extensive experience in cartography and archaeological illustration. She has participated in restoration of historic sites in Pennsylvania and Delaware and has prehistoric site survey level experience in Utah, Arkansas and Missouri. She has also taken graduate courses in historical archaeology at Temple University.

Editorial control and continuity was provided by Michele Nathan.

Michele Nathan

Editor

Ph.D., 1977, Anthropology, Tulane University
M.A., 1973, Anthropology, Florida Atlantic University
B.A., 1972, Anthropology, Duke University

Dr. Nathan is the principal editor for the Institute's scientific publications. She interacts with the scientific writers, the technical peer review staff and the graphics department to assure a complete, adequate and well-written document. She is responsible for the editorial and production functions, including rewriting, editing, proofing and ensuring quality of camera ready copy.

The 1978 testing was performed under the direction of Roderick Brown and Thomas Fahey.

The field data gathering was performed by the following team of the Iroquois Research Institute staff.

Kenneth Aich
Dayton Bard
William Boismier
Roderick Brown
James Collins
Roberta Comstock
David Elcock
Thomas Fahey
Bertram Herbert
Cheryl Holt
Mark McCallum

Patricia Miller
John Mohr
Teresa Ossim
Larry Paris
Katie Parker
Sharon Parks
Jane Reilly
James Schoen
Kathy Smith
Wesley Stinson
Roger Williams
Andrew Yaros

The laboratory effort for the project was performed by the following members of the Iroquois Research Institute staff.

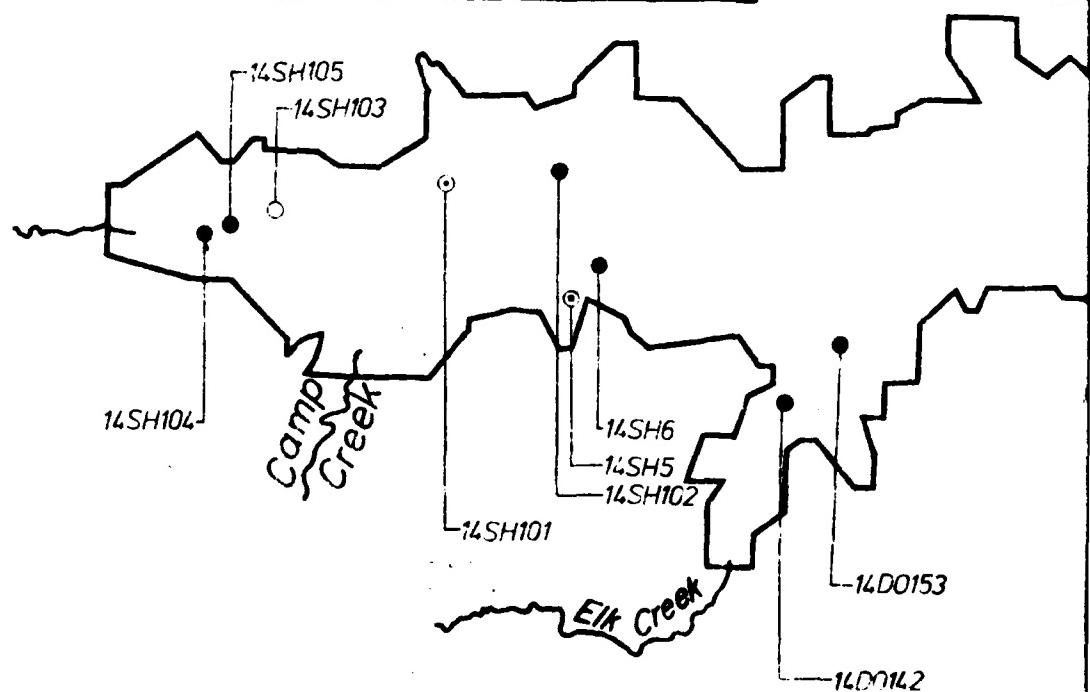
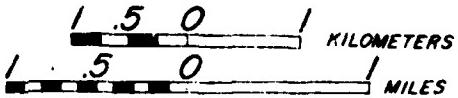
Sherry Brown
Adrian Church
Richard Fleming

Marie Gregory
Mark McCallum

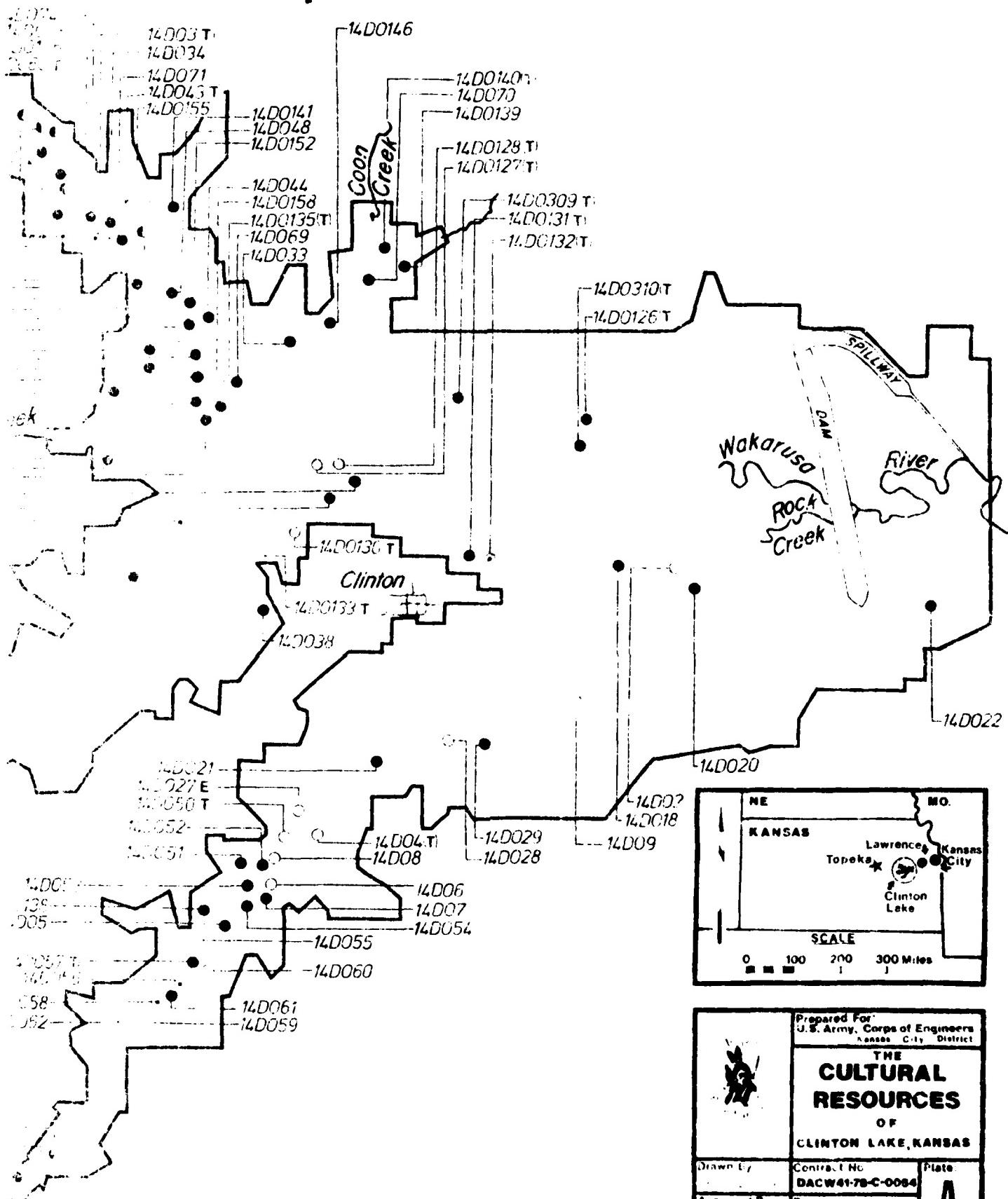
LEGEND

PREHISTORIC

- General Prehistoric Sites
- Paleo-Indian Sites
- ◎ Archaic Sites
- Archaic, Plains Woodland and Plains Village Sites
- ◎ Archaic and Plains Woodland Sites
- Plains Woodland and Plains Village Sites
- Excavated Sites
- Tested Sites
- Plains Village Sites
- Plains Woodland Sites

SCALE

140015
140016
140017
140018
Rock Creek



END

FILMED

1-85

DTIC